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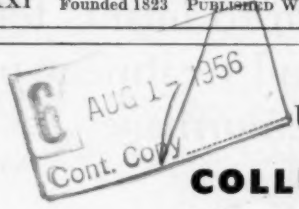

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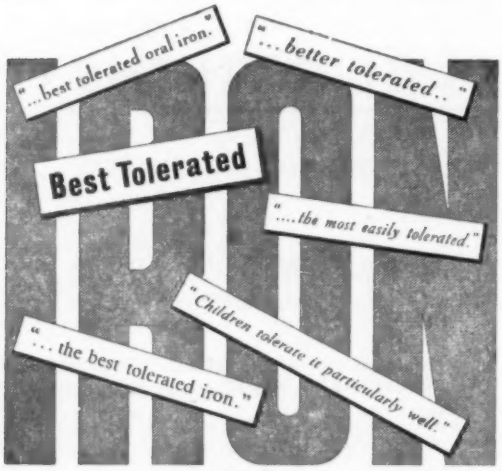

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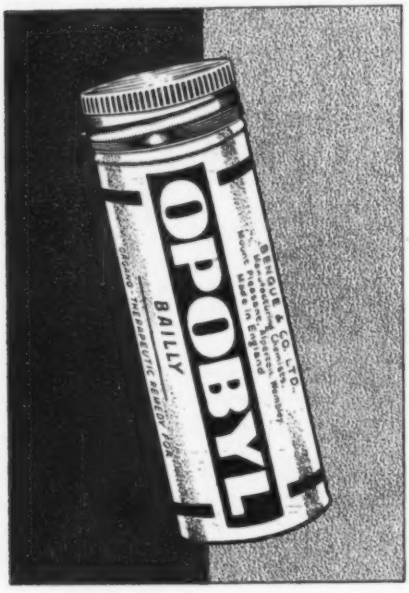

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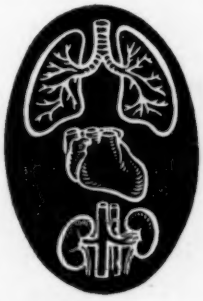

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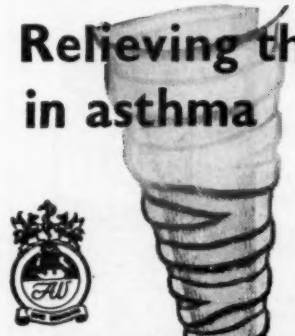

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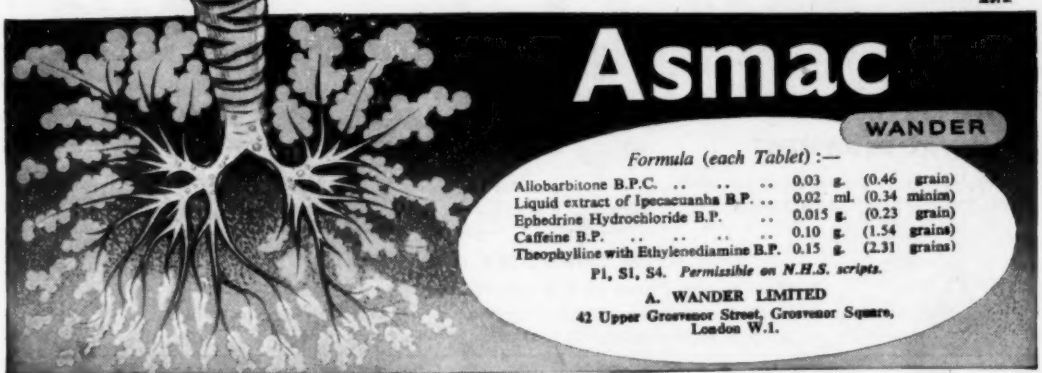

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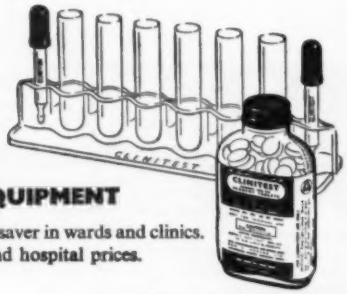

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(1954) '*Practical Clinical Biochemistry*', *Heinemann, p. 74*
(1954) 'Clinical Tests for Ketonuria', *'Lancet', July 10th, p. 95*

THE AMES COMPANY (LONDON) **LTD.**

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DON S. MOMAND LTD. 58 Albany Street, London, N.W.1.

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EXTRA

Strength, lightness and resistance to water combine to make this new type of plaster of Paris bandage much more economical in use

Very hard, water resistant casts result when plaster of Paris is polymer reinforced. That is why Gypsona 'Extra' has, in addition to all Gypsona's well-known qualities, these extra advantages :

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Gypsona 'Extra' casts outlast all other plaster casts and are more resistant to damage and the effects of water.

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Casts are thin, comfortable to wear, and therefore allow better functional treatment.

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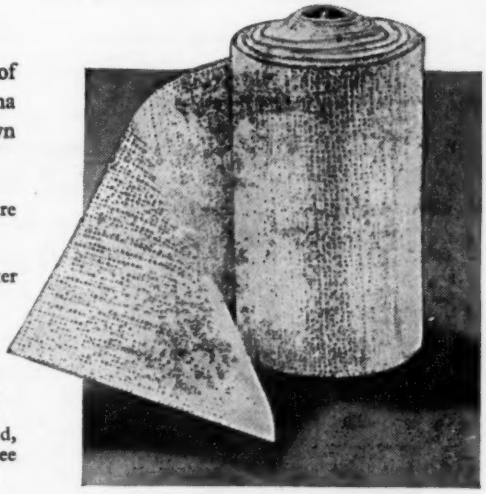

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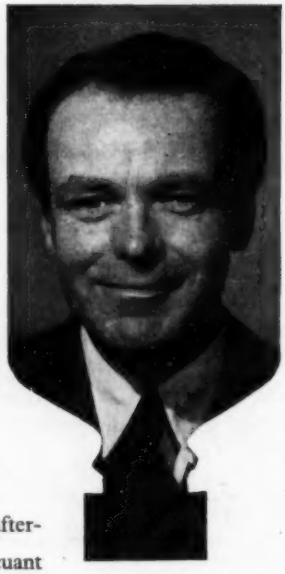

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Bislumina was specifically developed to embody in a single compound all those properties considered desirable in an agent for the treatment of dyspeptic disorders. Bislumina combines protective sedative and antipeptic properties with a sustained and desirable degree of acid neutralisation.

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Bislumina is available as a palatable smooth cream in bottles of 12 fluid ounces.

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Bislumina

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In accordance with world patents pending.

Elastoplast Airstrip

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Waterproof yet non-occlusive, this new first-aid dressing PREVENTS MACERATION

Elastoplast Airstrip is made from a specially developed plastic material which is not perforated but consists of a microporous extensible filter. Sweat and skin exudates evaporate through this air-permeable dressing at the same rate as they develop on the skin. At the same time this new dressing is waterproof, preventing water, grease and oil from coming in contact with the wound.

Airstrip allows the wound to "breathe"; therefore maceration cannot develop. Because the surface of the wound and surrounding skin remain dry, the dressing can be left on until the wound heals—which it does under ideal dry conditions.

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The air-permeable Elastoplast Airstrip dressing prevents development of maceration. Healing takes place in minimum time.

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The **anticholinergic** is 'Merbentyl'*—*free from side-effects.*

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The **antilysozyme** is Sodium Lauryl Sulphate—to inhibit lysozyme and pepsin over-activity.

N.B. *'Kolantyl' makes unnecessary the separate administration of antacids and anticholinergics.*

* 'Merbentyl' brand diethylaminocarbethoxybicyclohexyl hydrochloride.

'Kolantyl' is available in Gel or Tablet form.

The basic N.H.S. costs of 'Kolantyl' Tablets are 6s.4d. (50) and 25s.4d. (250). 'Kolantyl' Gel costs 6s.4d. per 12 fl. oz. bottle. P. Tax extra in each case.

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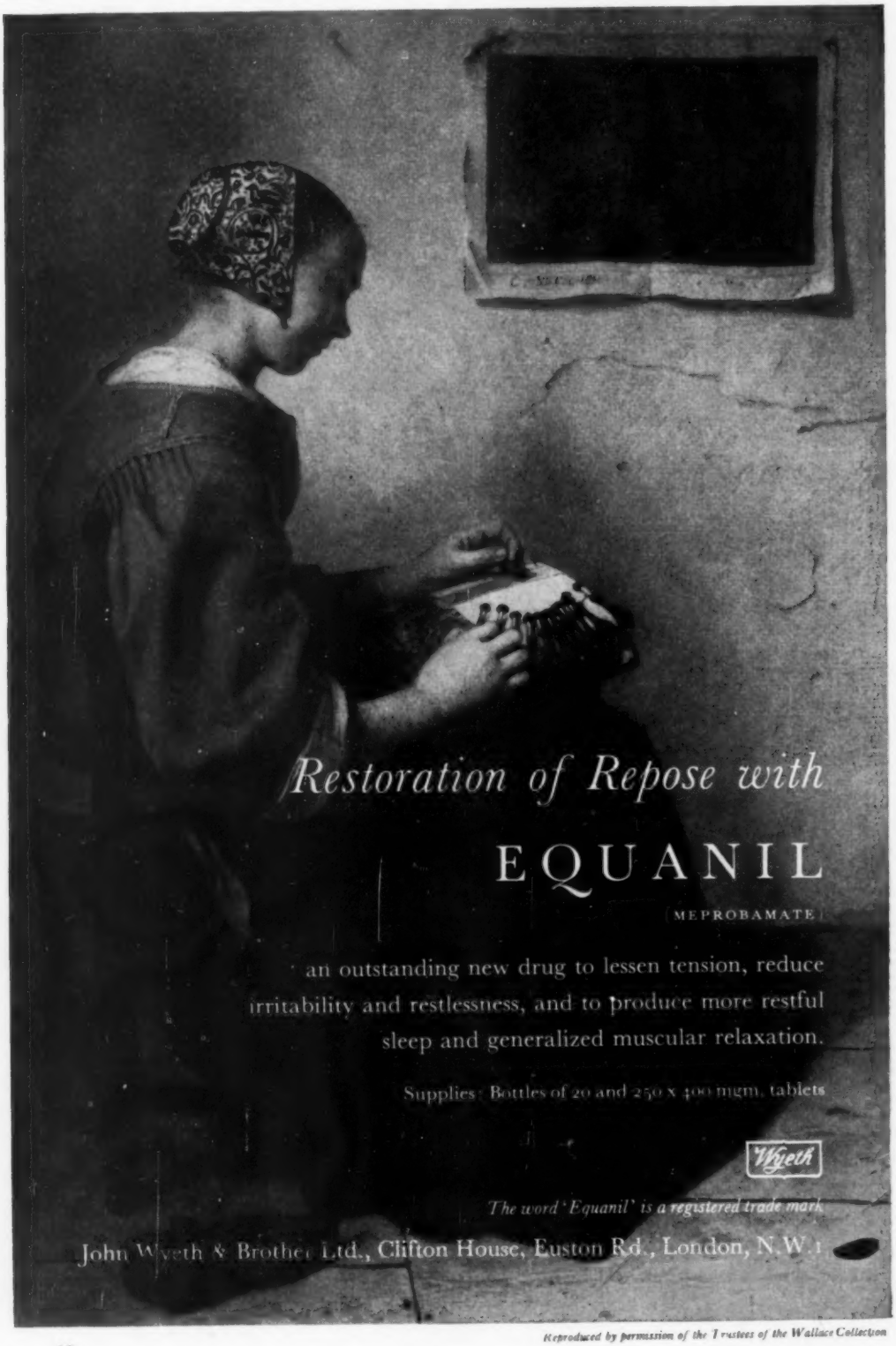
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...to CORTISONE

an all-British achievement by BOOTS

"Elephant's Foot" is the name given to a South African root, the all-important source of Diosgenin. This is the basic material used for the synthesis of Boots Cortisone and its derivatives.

Thanks to this oddly-named root, Boots are assured of a plentiful supply of the raw material for an all-British Cortisone from non-dollar sources.

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(*Prednisolone-Delta-1-hydrocortisone*)

Delta-Stab Tablets are at present available through N.H.S. Hospitals only by arrangement with the Ministry of Health.

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The esters of NICOTINIC, SALICYLIC and p-AMINOBENZOIC acids bring relief to cases of arthritis and rheumatism

"Thank you, doctor"

IN CASES OF soft-tissue rheumatism, and arthritic disorders, many doctors are tending more and more to regard Transvasin as an indispensable adjuvant to treatment.

For Transvasin is composed of the esters of nicotinic, salicylic and p-aminobenzoic acids. These esters readily pass the skin barrier in therapeutic quantities, and so enable an effective concentration of drugs to be built up where they are needed.*

Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant and can be safely used on delicate skins.

It is now being widely prescribed, with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

**Therapeutische Umschau VIII, 1952, 10, 143.*

Salicylic acid tetrahydrofurfuryl-ester...	14%
Nicotinic acid ethyl-ester.....	2%
Nicotinic acid n-hexyl-ester........*	2%
p-Aminobenzoic acid ethyl-ester.....	2%
Water-miscible cream base ad	100%

Transvasin is available in 1 oz. tubes, basic N.H.S. price 2/6 plus P.T., and is not advertised to the public. Samples and literature will be glady sent on application.

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If children had their own way, some strange diets would emerge. Most children are food-faddists with likes and dislikes that frequently lead to impaired nutrition. Insurance against such nutritional problems is adequately provided by a daily dose of the newly introduced VI-MAGNA SYRUP — specially formulated to correct inadequate intake or utilization of dietary vitamins. Its delicate orange flavour will appeal particularly to the food-faddist child, who can derive all the vitamins essential for nutritional well-being from ONE TEASPOONFUL DAILY.

Vi-Magna* Syrup

BRAND OF MULTIVITAMINS *Lederle*

Contains vitamins A and D made water-soluble for better utilization

Each teaspoonful contains:

Vitamin A	5000 I.U.	Ascorbic Acid (C)	75 mg.
Vitamin D	500 I.U.	Niacinamide	20 mg.
Thiamine HCl (B_1)	3 mg.	Calcium pantothenate	1 mg.
Riboflavine (B_2)	2 mg.	Vitamin B_{12}	5 mcgm.
Pyridoxine (B_6) HCl	0.2 mg.	as present in concentrated extractives from streptomyces fermentation	

Bottles of 4 fl. oz. and 16 fl. oz.

* Regd. Trade-Mark

50 FIFTIETH ANNIVERSARY Lederle

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'Dettol' REGD. is active...

against both Gram-positive and Gram-negative micro-organisms.
Under standard conditions of test a dilution of 1 in 200 kills Staph. aureus in 10 minutes; a 1 in 500 dilution kills Strep. pyogenes in 10 minutes.

'Dettol'—retains a high degree of efficiency in the presence of organic matter.

'Dettol'—is not incompatible with soap, traces of which need not be removed before application.

'Dettol'—is non-poisonous and non-staining.

'Dettol'—is well tolerated by the skin and tissues.

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Instrument Dettol is widely used as a most effective and practical means of disinfecting surgical instruments—steel, stainless steel and plated, as well as glassware, rubber appliances and nylon sutures.

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Surgical Dettol is a specially formulated tincture for the surgical preparation of the skin. It remains actively bactericidal for a considerable period after drying. It dries quickly and leaves a non-slippery surface. Bactericidal action is not adversely affected by the use of ordinary soap solutions. Surgical Dettol in clinical use has proved non-toxic and non-irritant when used in accordance with the directions.

For leaflets giving full information on Instrument Dettol and Surgical Dettol *Please write to:*
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A *new* treatment for hypometabolic states

Tertroxin (L-triiodothyronine), now introduced by Glaxo, is a swifter, safer-acting alternative to thyroid or l-thyroxine for the treatment of obesity, dysmenorrhoea and geriatric disorders.

Triiodothyronine is probably the ultimately effective form of the thyroid hormone acting directly on the metabolic processes of the cells. Though it shows important differences in its action from dry thyroid gland or thyroxine it produces all the therapeutic effects of both.

In the treatment of obesity, and the many other varied conditions that are typical symptoms of the 'hypometabolic state', the metabolic stimulus of Tertroxin is extremely valuable. It acts swiftly, there is no cumulative effect and dosage is easily adjusted according to the patient's response.

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Trade Mark

L-triiodothyronine sodium in 'scored' tablets of 20 micrograms. Bottles of 50 and 500 tablets.

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NEW dramatic aid to psychotherapy

Pacatal

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9-(1-methyl-3-piperidylmethyl) phenothiazine.

a powerful yet safe tranquillizing drug

Clinical trials in many countries have proved PACATAL to be highly effective in mental disturbances ranging from the psychoneuroses to the psychoses. In mild or severely disturbed states . . . anxiety, restlessness, excitement and abnormal behaviour . . . PACATAL reduces tension, makes the patient quieter, less confused — but still alert, objective, co-operative, amenable to psychotherapy.

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Pacatal **is available in tablets for oral administration**

Tablets 25 mg.
in bottles of 50 and 500.

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'Solupen'

'Solupen' is our new quickly-written name for crystalline penicillin G sodium salt and denotes soluble penicillin of the highest purity and potency. Also available – 'Solupen' Buffered.

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After rheumatic fever . . .

WHICH WAY?

Rheumatic fever is still one of the greatest causes of chronic disability and early death. The risk of a recurrence has been estimated to be 60-75% in the first three years after an initial bout.* Prophylaxis with a sulphonamide, 1 tablet twice daily throughout the dangerous period which follows an attack, can reduce this risk to 5% or even less.

Therefore, minimise the risk of relapse by prescribing a small daily dose of 'Sulphamezathine'. The outstanding characteristics of this sulphonamide are its low toxicity and cost. Prophylaxis with 'Sulphamezathine' costs (basic net cost to N.H.S.) approximately 10d. per week.

**J. Pediat.* (1946), *28*, 296.

Well tolerated, safe, sure

'SULPHAMEZATHINE'

Sulphadimidine B.P. Trade Mark

IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED, WILMSLOW, CHESHIRE
Ph.646 *A subsidiary company of Imperial Chemical Industries Limited*

Effective in a wide range of Childhood Illness

Suspension Chloromycetin* Palmitate, a palatable liquid preparation of Chloromycetin, simplifies the administration of this potent broad-spectrum antibiotic to infants and children, or to those patients unable to swallow capsules. Each teaspoonful (4 c.c.) provides 125 mg. Chloromycetin. Suspension Chloromycetin Palmitate has been used successfully in many serious respiratory infections of childhood, including staphylococcal pneumonia, bronchiolitis, laryngotracheobronchitis and early pertussis, as well as in acute infantile gastroenteritis and urinary infections.

Suspension Chloromycetin Palmitate

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MIL

New, Safe, Powerful Tranquillizer . . .

With these important advantages

Selective action in anxiety and tension states

Valuable sedative, hypnotic and muscle-relaxing properties...

Absence of toxicity . . . negligible side effects

Relaxes the patient for natural sleep without narcosis

Muscle relaxant in muscle spasm, pain and stiffness

Has no specific effect on blood pressure

No influence on autonomic regulatory mechanisms

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LEDERLE LABORATORIES DIVISION

presents

TOWN*

MEPROBAMATE

of far-reaching value in medical practice

Laboratory and clinical trials show MILTOWN to be the most remarkable tranquillizing drug yet discovered. Published reports on its initial success have been followed by its widespread adoption by doctors throughout America for restoring tranquillity in tension states, anxiety, stress and allied conditions. MILTOWN is now made available in Great Britain by Lederle.

Its value in the above conditions is due to an easing of the patient's anxiety tension, a lowering of irritability and its pronounced muscle relaxant action. It calms the patient for natural sleep. It has given a high proportion of good results in terms of relief of symptoms and a return to social productivity. It has proved effective in patients who have failed to respond to barbiturates and other conventional tranquillizers.

MILTOWN is fully active by mouth, shows a significant absence of toxicity and almost complete freedom from side effects. Among the conditions in which it has given good results are : Tension states, acute and chronic anxiety states, menstrual stress, tension headache, alcoholism, behaviour problems in children, hysteria and depression. In neuropsychiatric cases it has restored or improved patients who were delusioned, assaultive, noisy, disoriented and hallucinated.

MILTOWN

(2 methyl-2-n-propyl-1, 3 propanediol dicarbamate) is supplied in tablets of 400 m.g. for oral use. Bottles of 50.

*TRADE MARK

Cyanamid PRODUCTS LTD. LONDON, W.C.2

Milk-Alkali drip therapy in a tablet

Intragastric milk-alkali drip therapy [1,2,3] successfully provides a means of giving continuous neutralization of gastric acidity.

Nulacin Tablets, unique* in their composition of milk solids and antacids in suitable combination and proportions, give effective control of gastric acidity.

It has been confirmed by clinical trials in three Continents [4,5,6,7,8,9,10,11,12] that Nulacin Tablets, when allowed to dissolve in the mouth, give continuous neutralization of gastric acidity.

Nulacin is available throughout the British Commonwealth, in the U.S.A., and many other countries. It is known as Nulactin in Canada and Sweden.

Nulacin Tablets, which can be prescribed on E.C.10, are manufactured by

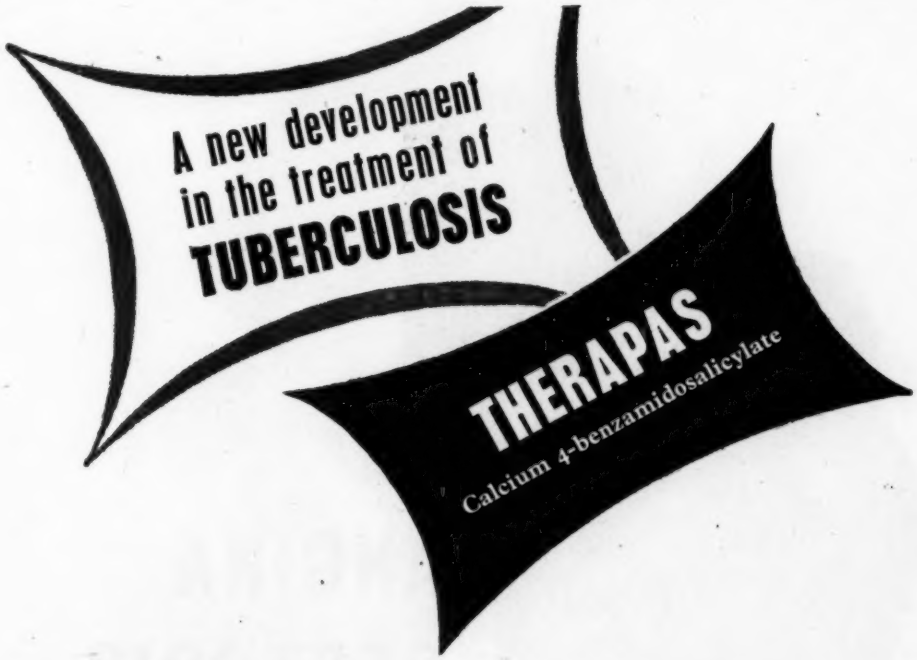
Horlicks Limited, Pharmaceutical Division, Slough, Bucks.

NULACIN

International Congress of Gastroenterology,
Stand No 5, Royal College of Surgeons, London

1. A New Therapy of Peptic Ulcer: Continuous alkalinized milk drip into the stomach. *American Journal of Medical Science,* 1933, **185** : 695
2. Intragastric drip therapy for peptic ulcer: Summary of ten years' experience. *J.A.M.A.,* 1942, **120** : 743
3. The efficacy of the drip method in the reduction of gastric acidity. *Am. J. Digest.,* Dis. 1942, **9** : 332
4. The Control of Gastric Acidity. *Brit. Med. J.,* 26th July, 1952, **2** : 180-182
5. Medical Treatment of Peptic Ulcer. *Med. Press,* 27th February, 1952, **227** : 195-199
6. Discussion on Peptic Ulceration. *Proc. Roy. Soc. Med.,* May, 1953, **46** : 354
7. The Effect on Gastric Acidity of "Nulacin" Tablets. *Med. J. Aust.,* 28th November, 1953, **2** : 823-824.
8. Control of Gastric Acidity by a New Way of Antacid Administration. *J. Lab. Clin. Med.,* 1953, **42** : 955
9. Further Studies on the Reduction of Gastric Acidity. *Brit. Med. J.,* 23rd January, 1954, **1** : 183-184
10. Clinical Investigation into the Action of Antacids. *The Practitioner,* July, 1954, **173** : 46
11. Management of Peptic Ulceration in General Practice. *Med. World,* December, 1954, **81** : 591-601
12. Ambulatory Continuous Drip Method in the Treatment of Peptic Ulcer. *Amer. J. Dig. Dis.,* March, 1955, **22** : 67-71
13. Notes on Remedial Agents, *Med. Rev.,* October, 1955, **49** : 142
14. Antacids in Peptic Ulcer. *The Practitioner,* January, 1956, **176** : 103.

**British Patent No. 715874* *Australian Patent No. 159135* *Canadian Patent No. 507783*



THERAPAS first synthesized in our laboratories in 1951, was introduced into tuberculosis therapy as an alternative to P.A.S. Detailed pharmacological studies have been published in this country (1), and Swiss workers have produced evidence (2) that calcium 4-benzamidosalicylate has a therapeutic action *per se*.

Therapas delays the emergence of streptomycin resistance. Its value in the treatment of genito-urinary tuberculosis is well established (3), (4), (5). Unlike P.A.S. (to which it is converted in the body) it has a slightly sweet, not unpleasant taste.

Effective though **Therapas** has been in these respects, it now appears from recent work (6) that it is of still greater importance. The results indicate that :

Therapas, in combination with isoniazid or streptomycin, gives satisfactory clinical and radiological results in the treatment of pulmonary tuberculosis.
Therapas is just as effective as P.A.S. in delaying the emergence of resistance to either isoniazid or streptomycin.
Therapas can be used wherever P.A.S. is indicated, and is better tolerated.

Dosage: **Therapas** may be administered in daily doses of 14 G.
Availability: Individual packets of 3.5 G. in boxes of 100 packets.
1·0 G cachets in containers of 100 and 500.
Bulk powder in containers of 100 G and 500 G.

(1) *J. Pharmacy & Pharmacol.*, 1953, **5**, 849.

(2) *Schweiz. Med. Wschr.*, 1955, **85**, 222.

(3) *Brit. Med. J.*, 1953, **1**, 95.

(4) *Brit. Med. J.*, 1953, **1**, 901.

(5) *Lancet*, 1955, **1**, 116.

(6) *Tubercle*, 1955, **36**, 209.

Further information and prices from
Smith & Nephew Ltd.
Welwyn Garden City, Herts.

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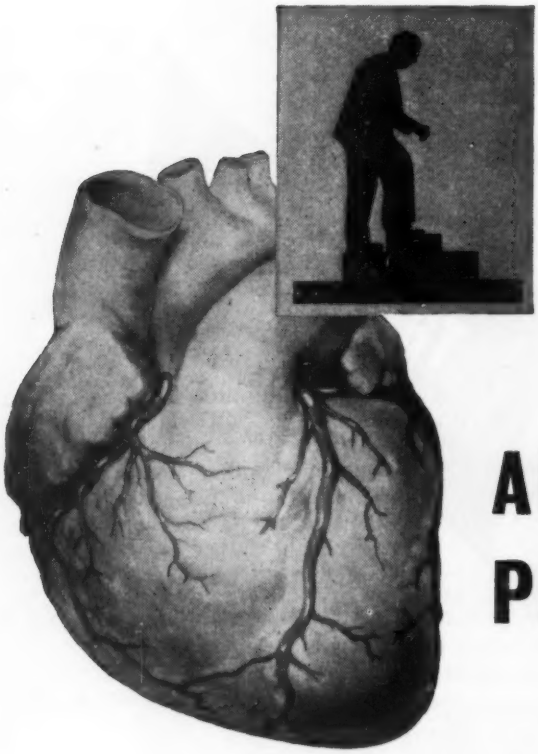

ANGINA PECTORIS

*MYCARDOL is a long-acting nitrite used in the routine control of angina pectoris. It gives prolonged protection against severe attacks, improves exercise tolerance and reduces the need for repeated doses of trinitrin—in some cases eliminating it altogether. Low toxicity makes this drug especially suitable for continuous long-term symptomatic treatment.

* *pentaerythritol tetranitrate.*

Mycardol

Trade Mark

Packings: tablets of 30 mgm. in bottles of 100 and 1,000. The basic N.H.S. cost of one week's treatment (6 tablets daily) is 9½d.

Literature and a sample will gladly be sent upon request.

BAYER PRODUCTS LIMITED Neville House, Kingston on Thames, Surrey
Associated export company: WINTHROP PRODUCTS LTD.

Children like it... worms don't

One week's treatment with 'Antepar' Elixir is usually sufficient to eradicate *threadworms*. A single dose clears *roundworms* from the gut. Effective without fasting, purging or supporting measures, 'Antepar' acts by paralysing the worms—they are then expelled by normal peristalsis.

'Antepar', the original elixir of piperazine, is well tolerated by patients of all ages. Its pleasant taste is popular with children. Containing piperazine citrate equivalent to 500 mgm. of piperazine in each fluid drachm, 'Antepar' is supplied in bottles of 4 fl. oz. and 20 fl. oz.

'ANTEPAR' ELIXIR

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) LONDON

Associated Houses: AUCKLAND BOMBAY BUENOS AIRES CAIRO CAPE TOWN DUBLIN KARACHI MONTREAL NEW YORK RIO DE JANEIRO SYDNEY

" No—there's a big difference, Mr. Baxter . . .

. . . as you will remember, in protamine zinc insulin, the action of the insulin is modified by the presence of a foreign protein, protamine. In contrast, I.Z.S. contains no protein or peptide material other than the insulin itself. That is its great advantage over other insulins. You see, gentlemen, the action of I.Z.S. persists for the required period by appropriate adjustment of the particle size of the insulin zinc compound. It is because the effect of I.Z.S. is entirely independent of any modifying protein, that allergic reactions following its use are virtually unknown. Any other questions ? "

I.Z.S. A.B. Vials of 10 c.c.
40 or 80 units per c.c.

I.Z.S. (Amorphous) A.B. Vials of 10 c.c.
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40 or 80 units per c.c.

Insulin Zinc Suspension A.B.

A B TRADE MARK

Joint Licensees and Manufacturers :

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PENTOXYLON

endows the anginal patient with a happy, useful life...

'Pentoxylon'—combining two effective and reliable agents, 'Rauwiloid' and P.E.T.N. in one tablet—provides a more comprehensive therapy for angina pectoris than has hitherto been possible using a single preparation. 'Rauwiloid'—a purified and standardized alkaloidal extract of *Rauwolfia serpentina*—has pronounced tranquillizing, bradycardic and stress-relieving properties; P.E.T.N. (pentaerythrityltetranitrate) is a powerful, long-lasting coronary vasodilator.

'Pentoxylon' not only relieves the coronary spasm, but helps to *prevent* attacks—reducing the apprehension of the patient living in dread of the next onset of pain, and so checking the cycle at its commencement.

- ✻ *Reduces tachycardia*
- ✻ *Increases exercise tolerance*
- ✻ *Reduces nitroglycerin needs*
- ✻ *Allays apprehension and anxiety*
- ✻ *Lowers blood pressure when this is raised*

RIKER

Each 'Pentoxylon' tablet contains 'Rauwiloid' 1 mg. and P.E.T.N. (pentaerythrityltetranitrate) 10 mg. The usual dose is one tablet four times daily always *before* meals. Up to eight tablets daily are well tolerated.

Descriptive literature will be supplied on request.

'Rauwiloid' and 'Pentoxylon' are registered trade-marks. Regd. Users;

RIKER LABORATORIES LIMITED

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IMPORTANT NEWS!

new

PREDICTABLE

oral therapy for hypertension

'INVERSINE' is a new and distinctive autonomic ganglionic blocking agent. It is a secondary amine, *not* a quaternary ammonium compound, and is 90 times more active than hexamethonium. When given orally absorption approaches 100%

ADVANTAGES: Reproducible clinical response · Small dosage · Minimal fluctuation of blood pressure · Gradual onset and long duration of action · Effective in cases resistant to hexamethonium

'Inversine'

ORAL TABLETS

(Mecamylamine Hydrochloride)

Oral convenience with parenteral reliability

Literature and professional package gladly sent on request

MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS

'INVERSINE' *(Mecamylamine Hydrochloride) 10 mg. quarter-scored tablets are supplied in bottles of 100*

'Inversine' is a Regd. Trade Mark

the growing problem of FOOD POISONING

In spite of improved conditions in many food shops and efforts to educate the public in general hygiene, a steady increase of food poisoning has occurred during recent years and constitutes a major problem in public health.

In the treatment of epidemics of enteritis, bacterial food poisoning, and common infections of the gastro-intestinal tract Guanimycin is of value both in the treatment of affected cases and in the elimination of the carrier state.

Guanimycin rapidly controls symptoms, restores well-being and reduces the duration of the illness.

GUANIMYCIN

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References: Brit. Med. J., 1956, **1**, *480 and 485 ibid., 952*
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PAGET'S DISEASE OF BONE

INCIDENCE AND SUBCLINICAL FORMS

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IT is now common knowledge that the condition that Paget (1877), in his first study, alluded to as "a rare disease of bones" is in fact rather common in persons of either sex past middle age. It appears in hospital practice as an incidental or subsidiary finding more often than as a principal cause of admission, and it is mainly from cases revealed by careful clinical, radiological, and biochemical investigation that very large surveys have been compiled—e.g., 116 cases reviewed by Gutman and Kasabach (1936), 154 by Brailsford (1938), 367 by Dickson et al. (1945), 82 by Newman (1946), and 111 by Rosencrantz et al. (1952). We have learnt much about Paget's disease from these and similar studies, which have shown us, for instance, that many people have Paget's disease in a latent or subclinical form, and that it may affect only limited regions of the skeleton, sometimes only a part of a single bone. Clinical surveys of this type have not, however, led to any reliable estimate of the over-all incidence of Paget's disease, because the sampling of the population at risk has been unsystematic. Recent estimates have ranged from an incidence of 1 in 4500 hospital admissions (Sugarbaker 1940) to 1 in 850 (Rosencrantz et al. 1952).

Schmorl (1932) published the full results of many years of pathological studies made in Dresden on the skeleton post mortem. Among 4614 necropsies on unselected persons aged more than 40 he discovered 138 cases of Paget's disease—an incidence of 3%. This figure has been neither challenged nor confirmed; although it is cited by most writers on Paget's disease, the great discrepancy between it and any clinical estimate of incidence is obvious.

I report here the results of a comparable pathological survey of the incidence of Paget's disease made in two general hospitals in Yorkshire. The material sampled, 650 bodies, though much less numerous than in the Dresden investigation, was substantial and unselected.

Methods

The data relating to incidence are based entirely on the results of pathological examination of necropsy material obtained at the General Infirmary at Leeds and at the Sheffield Royal Infirmary, and specimens obtained there were further examined in the pathology departments of the Universities of Leeds and Sheffield. Further data relating to age-distribution and sex-incidence and to the anatomical distribution of the lesions were compiled from 70 cases of Paget's disease studied pathologically, in 46 of which I made a detailed necropsy.

The search for Paget's disease at each necropsy began with an inspection of the body for characteristic deformities and with the removal of possibly diseased bones for detailed examination. Clavicles, ribs, and pelvic bones were inspected after removal of the viscera, and in many cases where the bone seemed thickened blocks were sawn from iliac or from pubic bones. The skull was opened in every case, and the bones of the cranial vault and base were carefully examined. At each necropsy a sagittal wedge of vertebral bodies was sawn out by making parallel or converging saw-cuts from the frontal aspect of the spinal column towards the spinal canal. In this way it is possible to lift out a string of vertebral bone blocks held together by the intervening discs and by the anterior and posterior ligaments. The specimen so obtained usually comprises the five lumbar and one or two sacral vertebræ but may sometimes be made to include several thoracic vertebræ. The examination of such a specimen, quite easily obtained, yielded the most important information.

In most cases where the necropsy was not made personally I inspected the cadaver, and in every case the sagittal wedge from the lumbosacral vertebræ was preserved for my later examination. So also were the vault of the skull if thick, soft, blue, or otherwise abnormal, and any other bone that was thought by the pathologist to be diseased.

Every suspect area of bone was examined histologically. Paget's disease was not diagnosed without histological confirmation, except in 1 case in which the only specimens preserved were macerated. In this instance the lesions were widespread and gross, and clinical and radiological findings had been indisputable.

Selected blocks of bone, after decalcification in a mixture of formic acid and citric acid, were trimmed with a knife and either embedded in paraffin or double-embedded in celloidin and paraffin. Sections were stained with Ehrlich's hæmatoxylin and eosin. Other stains were often used but are not necessary for reaching a diagnosis. A reticulin stain is often very informative and better than the use of polarised light in studying the fibre pattern of bone.

Pathological Recognition of Paget's Disease

The bony lesions of advanced Paget's disease are too well known to need description here, but this study was mainly concerned with the recognition of minor, localised, or early lesions, and the importance of some less-known characteristics in making the pathological diagnosis emerged.

Osteoclasis, the resorption of existing bone, is always the first process in Paget's disease, and may be seen microscopically at the advancing edge of every focus of the disease in a partially involved bone (fig. 1). It is usually succeeded closely by a wholly abnormal type of osseous hyperplasia, firstly of primitive coarse-fibred bone in a discontinuous trabecular system, later of massive and thick trabeculæ of a peculiarly disjointed lamellar pattern.

In some lesions in Paget's disease resorption of bone leads to large, though focal, areas of rarefaction, as in osteoporosis circumscripta of the skull and in the centra of the vertebræ. Regeneration of bone in Paget's disease always leads to an abnormal trabecular pattern, as easily recognised by the pathologist in the sawn bone as by the radiologist in the living skeleton (figs. 2 and 3). Trabeculæ tend to be coarse and widely spaced, leaving between them pools of diffluent red marrow (fig. 4), and oriented crudely in the axis of the principal stress and

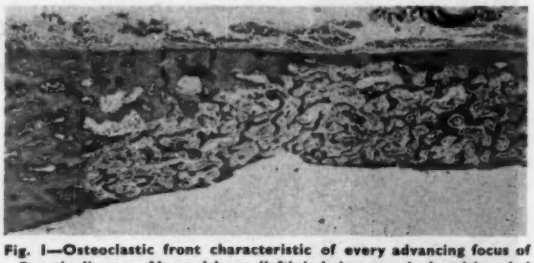

Fig. 1—Osteoclastic front characteristic of every advancing focus of Paget's disease. Normal bone (left) is being resorbed and invaded by vascular fibrous tissue containing many osteoclastic giant-cells. Trabeculæ of new coarse-fibred bone then appear (centre of field), and from these emerge the stouter bone masses (right) that show mosaic structure under higher magnification. The lesion has advanced further along the inner than the outer table. Section of skull of a man aged 80, whose pelvic bones were also affected. (Hæmatoxylin and eosin. × 8.)

Fig. 2

Fig. 3

Fig. 2—Sagittal section of lumbosacral vertebræ showing advanced sclerotic Paget's disease of L5 and S1. Ossification across intervertebral disc between two affected bones is unusual and may be related to fracture sustained twenty years earlier. Other vertebræ are somewhat porotic. From a man aged 70.

Fig. 3—Radiograph of specimen shown in fig. 2.

pressure lines (fig. 5). Towards the end-plates of the vertebræ (fig. 6), throughout the skull generally (fig. 7), and in various other situations a fibrocellular osteogenic tissue forms, so vascular that it oozes blood when the bone is opened. Microscopically, this is seen to comprise short trabeculæ and small islands of coarse-fibred bone lying in a highly vascular fibrous stroma (fig. 8), and superficially it resembles the early osteogenic phase of repair callus at a fracture site. Cartilage, however, is never elaborated by this tissue in Paget's disease. Moreover osteoclastic giant-cells are often much more prominent, and it seems that resorption and regeneration must follow one another repeatedly in these areas of new primitive bone growth. It is unsafe, however, to make a diagnosis from the microscopical inspection of only these areas of vascular osteogenic tissue. Similar fields may be found in callus, in parts of some bone tumours, and in some lesions of hyperparathyroidism and of fibrous dysplasia.

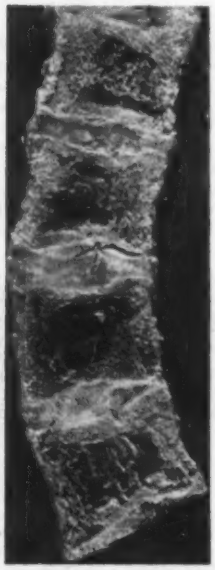

Fig. 4—Sagittal section of lumbar vertebræ L3–5 from a man, aged 72, with Paget's disease affecting many bones as well as the spine. Centra of L3 and 4 contain pools of diffluent red marrow. Bone that has supplanted normal structure forms coarse trabeculæ and, towards walls and end-plates, partly compacted bone masses.

The most important microscopical sign of Paget's disease is the mosaic of cement lines (fig. 9). It is seen in every area of the lamellar bone that eventually develops in the course of the disease to replace the original anatomical structure. The mosaic pattern was first clearly described by Schmorl (1930) and it is, as Jaffe (1933) says, virtually specific for Paget's disease. Bizarre lamellar patterns and "jerry-built" trabeculæ are seen in only a few other diseases, and they can be distinguished by the expert eye from those of Paget's disease. The cement-line mosaic is not seen in the coarse-fibred bone islands of the early osteogenic phase in Paget's disease; it appears only when lamellar bone has been organised. It is due to the abrupt interruptions and changes in direction of the bone lamellæ and fibres that result from the alternation of resorptive and regenerative phases to which any bone mass under construction is subjected during this disease. In effect, every lamellated trabecula or mass of compact bone that emerges in a focus of Paget's disease is constructed of unevenly oriented and ill-assorted blocks of bone mortared together by jagged lines of non-fibrillar cement substance (fig. 10). When the active phase of Paget's disease has slowly swept through the bone, when there is no longer osteoblastic or osteoclastic activity to be seen among proliferated endosteal cells, and when the marrow spaces, once filled with vascular and cellular fibrous tissue, become repopulated with hæmatopoietic marrow or with fat-cells, the bizarre pattern of fibres and the cement-line mosaic remain to identify the lesion.*

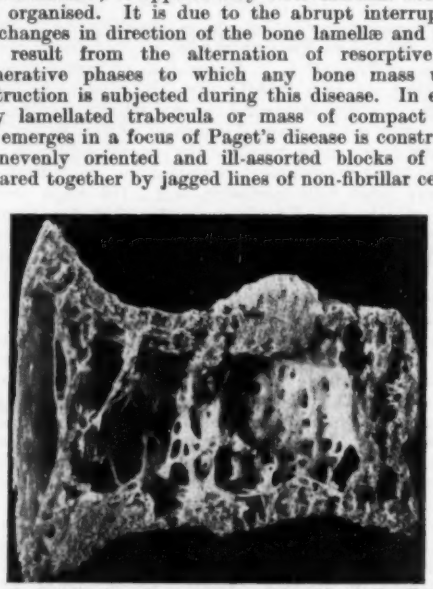

Fig. 5—Sagittal section of macerated vertebra L3 wholly affected by Paget's disease, showing coarse trabeculæ and large caves that were filled with red marrow, from a man, aged 77, with advanced Paget's disease affecting many bones.

Incidence

For the purposes of the incidence survey the skeleton was examined as described above, at 650 unselected

* It is not generally known that only a few hæmatoxylins can stain the cement lines clearly. Ehrlich's acid hæmatoxylin is very suitable for this purpose.

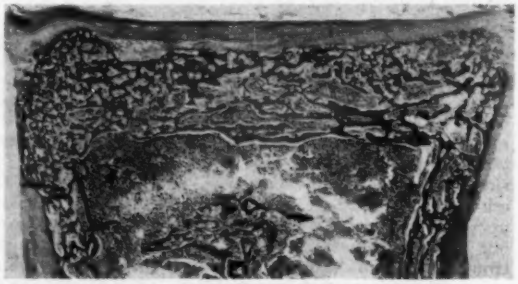

Fig. 6—Sagittal section of part of lumbar vertebra affected by Paget's disease, showing close-mesh bony hyperplasia below cartilaginous end-plate, coarse trabeculæ, and excavation of centrum. (Hæmatoxylin and eosin. × 2·75.)

necropsies. At Leeds there were 500 consecutive necropsies and at Sheffield, about two years later, 150 consecutive necropsies on all persons aged at least 40 dying in hospital in respect of whom permission for necropsy was obtained.

Pathological lesions of Paget's disease were discovered in 24 cases, an over-all incidence of 3·7% (table I). The smaller Sheffield sample yielded a lower incidence than the Leeds sample, but no significance attaches either to this or to the difference in sex-incidence. Both are largely due to the chance of finding only 1 case of Paget's disease among the 78 men of the Sheffield series. In the Leeds series at one time there was a run of more than 150 necropsies that yielded only 1 case, but at another time 3 cases were found in 5 consecutive necropsies.

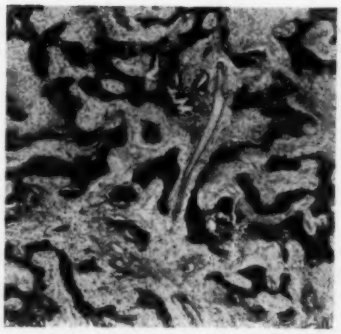

Fig. 8—Field of primitive coarse-fibred bone formed in Paget's disease. Note highly cellular fibrous tissue, prominent blood-vessels, and alternation of osteoclasts and osteoblasts among cells outlining disoriented trabeculæ. (Hæmatoxylin and eosin. × 25.)

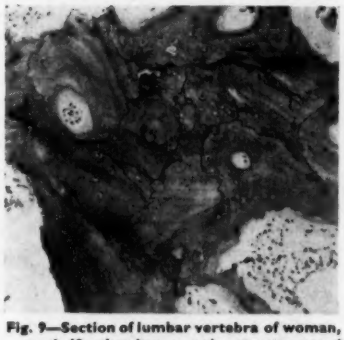

Fig. 9—Section of lumbar vertebra of woman, aged 63, showing mosaic structure and prominent cement lines of bone ultimately produced in Paget's disease. (Ehrlich's hæmatoxylin and eosin. × 150.)

The inquiry was designed to yield figures that would compare with those of Schmorl (1932), and its results agree substantially with his (table II).

There is no reason to doubt, if these findings in persons dying in hospital are representative of the general population, that both in this country and in Germany about 1 in every 30 persons over the age of 40 has Paget's disease affecting some part of his skeleton.

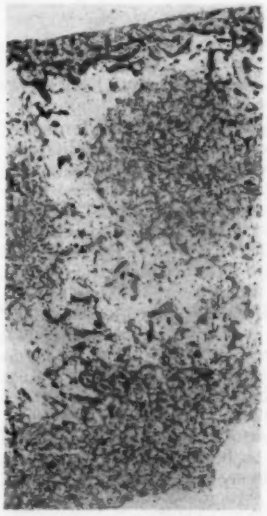

Fig. 7—Section of skull affected by Paget's disease in woman, aged 88, showing disseminated foci of vascular osteogenic fibrocellular tissue forming new primitive bone. Earlier resorption of normal bone of both tables has led to extreme porosity of skull. (Hæmatoxylin and eosin. × 3·75.)

Sex.—Most clinical and radiological surveys have shown a slight preponderance of men among sufferers from Paget's disease. Schmorl's necropsy data also show this (table II). The higher proportion of women with Paget's disease in my incidence survey is of little importance since the sample was relatively small, revealing only 24 cases. There are, however, 46 additional cases on my pathological files, and the proportion of sexes in this total of 70 cases is 40 men (57%) and 30 women (43%)—a division of the sexes more in keeping with that observed in other large published series. Of Schmorl's 138 cases 58% were men and 42% women. Even if there are about 4 male to 3 female sufferers, the disease is still common in both sexes.

Age.—The frequency with which Paget's disease was discovered at different ages is uneven (table III) because of the relatively small numbers in each five-year group. When these figures are collected into fifteen-year groups, however, the way the incidence of the disease increases with the age of the patient becomes more apparent.

It will be seen from table III, and from table IV where my total series of 70 cases is again considered, that Paget's disease becomes especially prominent after the age of 55. My experience is that 9 out of 10 examples of the disease are found in persons of at least this age.

Paget's disease is rare under the age of 40. Schmorl (1932) stated that he had never seen it, but Dickson et al. (1945) diagnosed it radiologically in 30 persons aged less than 40 among 367 cases, and the 7th of Paget's (1882) second series of cases was a woman whose tibiæ first became painful and deformed when she was aged only 28. I have only once had pathological material from a patient aged less than 40 (a woman aged 30 with a lesion of one tibia) among 70 cases in which I examined biopsy or necropsy material (table IV).

In sum, Paget's disease is exceptional below the age of 40, uncommon between the ages of 40 and 55, common (3–4%) after the age of 55, and of high incidence (10%) in very old people.

Anatomical Distribution of Lesions

For the purpose of this analysis I have added to the 24 cases revealed in the incidence survey a further 22 cases of Paget's disease where I have made a detailed necropsy. The anatomical distribution of the lesions discovered in these 46 cases is shown in table V. The salient findings agree broadly with the analyses given by other workers, but no detailed comparison can be made, partly because of differences in technique and

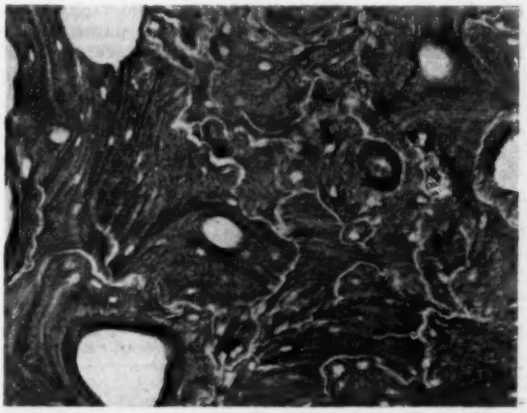

Fig. 10—Characteristic bone structure in late phase of Paget's disease, showing mosaic of differently oriented lamellar pieces joined together along jagged cement lines, which show very clearly in this section where the reticulin fibres are stained. (Laidlaw's silver method. × 160.)

TABLE I—INCIDENCE OF PAGET'S DISEASE IN PERSONS AGED 40 OR MORE IN CONSECUTIVE SERIES OF UNSELECTED NECROPSIES IN GENERAL HOSPITALS IN LEEDS AND SHEFFIELD

—	No. of necropsies	No. of cases of Paget's disease
Men :		
Leeds	295	12
Sheffield	78	1
Total	373	13 (3·5%)
Women :		
Leeds	205	8
Sheffield	72	3
Total	277	11 (4·0%)
Both sexes :		
Leeds	500	20
Sheffield	150	4
Total	650	24 (3·7%)

extent of the examination, and partly because of variations in the anatomical headings under which the lesions have been classified. Schmorl's pathological examination included the whole vertebral column. I routinely examined only the lumbar vertebræ. Schmorl in his analysis has a separate heading for sacrum, which I include under lumbosacral vertebræ and most radiological studies include under pelvis. In spite of these vagaries it is clear from all substantial reports that the commonest site of Paget's disease is the lumbosacral spine and pelvis. Schmorl's (1932) list of sites is headed by the sacrum (56%) and other parts of the vertebral column, mainly lumbar (50%). Dickson et al. (1945) radiologically found the pelvis, including apparently the sacrum,

TABLE II—INCIDENCE OF PAGET'S DISEASE IN PERSONS AGED 40 OR MORE

—	Leeds and Sheffield		Dresden (Schmorl 1932)	
	No. of necropsies	Incidence of Paget's disease	No. of necropsies	Incidence of Paget's disease
Men ..	373	3·5%	2279	3·5%
Women ..	277	4·0%	2335	2·5%
Total ..	650	3·7%	4614	3·0%

to be the most usual site of Paget's disease (78% of 307 cases). Brailsford (1938) stated that Paget's disease was most often first discovered in the pelvis (58%) but that this was "entirely due to radiography," the discovery often being a chance one in patients with indefinite aches and pains. This is, however, not the true explanation. The disease really is common in the sacrum and pelvis.

The next most common site, after the lumbosacral spine and pelvis, is probably the skull, although the femurs, especially because of the involvement of the cancellous proximal parts, hold an almost equal place in the analyses of Schmorl and of Dickson et al. In the skull Paget's disease takes many forms. Softness, porosity, and great vascularity are the general naked-eye features. The distinction between the outer and inner tables and the diploë soon becomes lost, and there is usually some increase in thickness, but great thickening and enlargement of the skull, although a classical feature, is relatively uncommon. Patchy or focal disease in the skull is often met with, and in my experience about 10% of affected skulls show the sharply outlined and mainly resorptive lesion that Schüller (1926) called osteoporosis circumscripta. The pathological features

TABLE V—ANATOMICAL DISTRIBUTION OF LESIONS OF PAGET'S DISEASE IN 46 CASES AT NECROPSY

Site	Lesions present (no. of cases)
Lumbosacral vertebræ	35 (76%)
Skull	30 (65%)
Pelvic bones	22 (43%)
Femur (one or both)	16 (35%)
Tibia (,, ,, ,,)	14 (30%)
Clavicle(,, ,, ,,)	5 (11%)
Sternum	3 (7%)
Fibula	2 (4%)

Also in 1 case each : scapula, humerus, radius, phalanx, mandible, ribs, and patella.

of this lesion have been described in detail elsewhere (Collins and Winn 1955).

Clinical observers are generally strongly impressed by the striking deformities of the long bones, but these are seen only in a few, mostly advanced, cases. It is easy to lose sight of the fact that Paget's disease has a predilection for the bones of the central or axial skeleton, those bones, in fact, that contain hæmatopoietic red marrow throughout adult life. Spine, pelvis, skull, and femur were the sites of 77% of the lesions in my series, 81% in Schmorl's, and 76% in those of Dickson et al.

These bones are also, incidentally, those most favoured by bloodborne metastases in cancer of various kinds (Willis 1952), being the seat of 66% of the osseous metastases of mammary carcinomas studied by Lenz and Freid (1931), and of 72% of skeletal metastases in general (Sutherland et al. 1932). A notable difference, however, between the localisation of Paget's disease and that of metastatic cancer is to be seen in ribs and tibia. A high proportion of osseous secondaries may be found

TABLE III—AGE-DISTRIBUTION OF PAGET'S DISEASE IN 650 UNSELECTED NECROPSIES

Age (yr.)	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85–89	90–94	All ages
No. of necropsies	33	55	77	83	103	87	97	77	27	8	3	650
No. of cases of Paget's disease	1	0	2	6	2	2	4	3	3	1	0	24
Percentage incidence :												
5-yr. groups	3·0	0	2·6	7·3	1·9	2·3	4·1	3·9	11·1	12·5	0	3·7
15-yr. groups	1·8				3·6			5·0			9·1	

TABLE IV—AGE-DISTRIBUTION OF 70 CASES OF PAGET'S DISEASE DIAGNOSED FROM PATHOLOGICAL MATERIAL COLLECTED FROM VARIOUS SOURCES, INCLUDING 24 CASES SHOWN IN TABLE III

Age (yr.)	< 40	41–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85 +	All ages
Cases of Paget's disease	1	1	1	4	10	9	16	13	6	6	3	70
	7 (10%)				63 (90%)							

in the ribs. Among 68 cases with skeletal metastases studied by Willis (1952) there were 39 in which ribs were involved. Myelomas, like secondary cancers, are also very often located in the ribs. Lesions of Paget's disease, on the other hand, were found in the ribs in only 1 of my 46 necropsy cases and in only 3% of the patients examined radiologically by Dickson et al. The tibia, by contrast, is the site of about 10% of lesions in my own and most other studies of Paget's disease, although Schmorl found only 3% of lesions located there; whereas it is so rare a site of cancer metastases that it is not mentioned in most analyses. In the clinical case, therefore, where there is some doubt whether the radiographic picture is one of carcinomatosis or of Paget's disease the discovery of lesions in the ribs favours the former and in the tibia the latter diagnosis.

We are not yet in a position to deduce why Paget's disease has a predilection for certain bones, especially the lumbosacral spine. Albright and Reifenstein (1948) believe that the disease favours "that part of the skeleton which is most subject to stresses and strains." But this can hardly be the whole explanation in view of the different parts of the skull where a focus of Paget's disease may become established and in view of its rarity in any of the distal bones of the limbs except the tibia.

In my opinion exposure to stress and strain should be considered in conjunction with the presence of a mainly cancellous architecture and the persistence of hæmatopoietic, and therefore highly vascular, marrow in the bones that are most often affected. All these factors tend to maintain a labile field of cellular growth and function in the bony and endosteal tissues. The lesions of Paget's disease result from the variously directed and imperfectly coördinated activities of these cells. They form, as it were, a caricature of the normal adaptive remodelling of bone that often takes place in these skeletal areas in response to changing mechanical, hormonal, or metabolic conditions. The cause of Paget's disease, however, is quite unknown. Its characteristic localisation is important, but other features, especially the distinctive age-incidence, may be of equal significance.

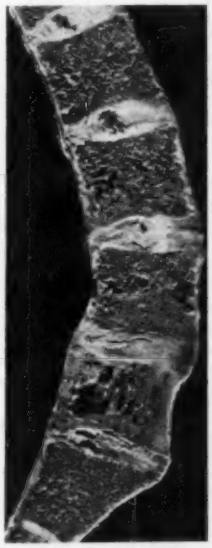

Fig. 11—Sagittal block of lumbosacral vertebræ of woman, aged 55, showing solitary focus of Paget's disease in L5 in late stage of evolution (cf. fig. 4). No other focus was detected elsewhere in skeleton, and bone of adjacent vertebræ is histologically normal.

The Solitary Focus

What has come to be known as mono-osteitic or monostotic Paget's disease was first specially discussed by Newton (1924) in 3 cases where the lesions were apparently localised to the tibia. There must always be some doubt whether other foci of the disease have been overlooked in such cases, but many similar reports have been published, and it is exceedingly likely that Paget's disease may affect no more than a single bone, or even only part of a single bone, throughout the lifetime of a patient. Delitala (1946), who studied 110 cases radiologically, reported 10 instances in which Paget's disease was exclusively localised to a single vertebra. Collins and Winn (1955) studied post mortem 5 cases of osteoporosis circumscripta of the skull and found other skeletal lesions of Paget's disease in only 1 of them.

Among the 46 post-mortem cases of Paget's disease analysed in table v there were 5 in which there appeared to be only a solitary focus of the disease. In 3 cases it was in the skull, in 1 in a single lumbar vertebra (fig. 11), and in 1 it affected only a part of one tibia, so far as the limitations of the skeletal examination could be considered to exclude the presence of multiple foci.

The solitary lesion differs in no respect from other lesions of Paget's disease. Naturally the solitary focus is likely to remain clinically undetected, but it is not true to say that it represents an early phase of Paget's disease. Indeed the solitary focus may show the process, throughout the limited area of involvement, to be in a late stage of evolution with much sclerotic hyperplasia of bone.

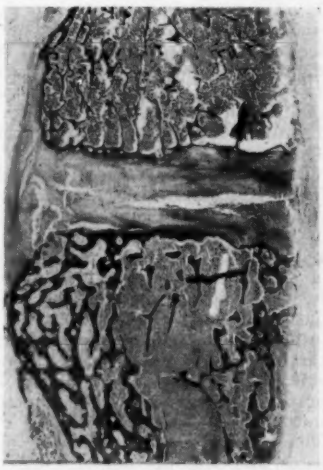

Fig. 12—Sagittal section of body and manubrium of sternum of man, aged 83, with many foci of Paget's disease. Body of the sternum (below) shows coarse trabeculæ and wide-mesh marrow spaces filled with vascular fibrous tissue anteriorly (left) and with hæmatopoietic marrow centrally. Manubrium (above) is unaffected and somewhat porotic and contains hæmatopoietic tissue. (Hæmatoxylin and eosin. × 3·2.)

Once Paget's disease has become established in a bone it tends eventually to affect the whole of it, although it may take many years to spread through the length of the femur, for example. But intact joints and symphyses seem to be barriers to the spread of Paget's disease (fig. 12), and multiple lesions are as likely to be found in scattered as in adjacent vertebræ or other bones. Albright and Reifenstein (1948) were fully justified in emphasising that Paget's disease is not a generalised disease of bone. Although the lesions may be multiple and disseminated they remain focal, and it is not improbable, from the available data, that in about 1 in 10 cases there is no more than a solitary focus.

Subclinical Forms

Of the 24 cases of Paget's disease revealed at necropsy in the incidence survey only 7 (29%) were diagnosed before death. Of these patients 6 had widespread and obvious Paget's disease affecting spine, pelvis, and skull, and in 5 of them the tibiæ also were affected. The seventh diagnosis was made from the radiological appearances of the pelvic bones in a man aged 50 with ankylosing spondylitis. By chance the two diseases were concomitant. None of the 7 patients diagnosed as cases of Paget's disease was admitted to hospital because of the skeletal disease. The causes of admission were cholelithiasis, prostatic enlargement, hernia, chronic nephritis, coronary atheroma, erysipelas, and ankylosing spondylitis. Another man, aged 55, fractured his cervical spine by falling off a bicycle. Necropsy revealed Paget's disease affecting almost every vertebra from c2 to s1 and the skull. Had this patient not died very soon after admission, the underlying bone disease would have been quickly diagnosed radiologically.

It is therefore reasonable to affirm that clinically manifest Paget's disease was present in 8 of the 24 cases, but that in only 1 case did it or its complications (in this case a broken neck) lead directly to admission to hospital.

Two-thirds of the patients had Paget's disease in subclinical form. In only 2 of the 16 undetected cases was there any sign of involvement of the long bones—a slight thickening of a tibia in each case. In the other 14 cases Paget's disease was confined to spine, pelvis, or skull, with clavicles and sternum affected in 2 cases. There were 3 cases with solitary foci of the type discussed above.

My experience in these and other cases shows that Paget's disease must usually affect many bones, including some of the long bones, before it is recognised clinically, even in inpatients, unless it is detected by chance during radiographic examination for some other complaint, or unless a complication of the disease, such as fracture, bone sarcoma, or, more rarely, cardiac failure of high-output type (Edholm et al. 1945) calls attention to its presence. Many patients with extensive disease pass through life undiagnosed because they are never submitted to the scrutiny that follows admission to hospital. For every case clinically diagnosable there must be at least 2 persons with Paget's disease in subclinical form that causes neither symptoms nor physical signs and can be detected only by radiological, biochemical, or pathological methods of examination.

Of 24 patients with Paget's disease only 1 was selected for inclusion in the incidence survey because his disease contributed to his admission to hospital. Of the 22 additional cases studied post mortem, a more selected group, only 3 were admitted to hospital because of Paget's disease (the diagnoses being fractured femur, fractured transverse process, and osteosarcoma). It is therefore almost certainly a gross overestimate to say with Newman (1946) that 48% of patients present with symptoms of Paget's disease. The figures of my incidence survey suggest that in not more than 5% of cases are the patients admitted to hospital because of Paget's disease. How many may seek medical help outside hospital for Paget's disease is unknown, but it cannot be more than about 30% if Paget's disease is present in a clinically silent form in the remainder.

Discussion

Schmorl (1932) fully investigated the skeleton in unselected necropsies and determined the over-all incidence of Paget's disease to be 3% in persons aged more than 40. The present investigation on similar lines made in the post-mortem rooms of Yorkshire hospitals reveals an incidence of 3·7%. Reasons have been given why it is thought that a relatively small factor of selection operates in bringing patients with Paget's disease into a general hospital and in singling them out for necropsy. In 96% of the cases reviewed death was due to diseases quite unconnected with Paget's disease.

If we accept 3–4% as the incidence of Paget's disease in the hospital population aged more than 40, it is hardly surprising that Fairbank (1951) ascertained from the radiologists of London teaching hospitals that each saw about 50 new cases of Paget's disease a year. It is indeed probable that more than 300 cases, of which perhaps 100 might be detectable, are admitted each year into any general hospital of 500 beds.

This concept of the prevalence of Paget's disease is out of all proportion with estimates derived from other than pathological data. Rosencrantz et al. (1952) discovered 111 cases among 94,112 admissions to a hospital in Bronx, an incidence of only 0·12%, which they claimed to be the highest figure of this sort yet recorded. It is very certain, however, that, short of radiographing the entire central skeleton of every patient admitted, the radiological detection of cases depends much on chance.

Hobson and Pemberton (1955), in the course of a health survey of civil pensioners, women aged more than 60 and men aged more than 65, living at home in Sheffield, estimated the serum-alkaline-phosphatase level in a small but unselected group of 162 (70 men and 92 women) and found it raised in 11 of them. Subsequent clinical and radiological examination revealed Paget's disease in 6 men and 2 women, an over-all incidence of 4·9%. This figure is not out of keeping with that determined from the necropsy surveys, having regard to the older age-groups here investigated.

The realisation of the wide distribution of Paget's disease in the middle-aged and elderly will call for the revision of our ideas about the frequency of its complications. Mercer and Duthie (1955), for example, state that fractures occur in nearly 20% of all cases; this must be an overestimate. In my 70 cases (table IV), where pathological material derived from either necropsy or biopsy was examined, there were 9 with fracture of a diseased bone (neck of femur, 2; shaft of femur, 2; patella, 2; cervical spine, 1; lumbar transverse process, 1; skull, 1), but most of this is highly selected material. Only 1 patient with fracture was included among the 24 of the incidence survey, and the occurrence of fracture among all persons with Paget's disease, including subclinical forms, inside and outside hospitals is likely to be much less, perhaps not more than 1%. Similarly the true incidence of superimposed osteosarcoma is probably far lower than is generally suggested. The files of a pathology department will collect almost every case of sarcoma, and this explains the exceptionally high figure of 13 patients with sarcoma among the 70 cases in my series. No case with sarcoma appeared among the 24 cases in the incidence survey, and most workers agree that it is a less common complication than fracture.

Paget's disease is, however, so widespread among the community that the complications of fracture and sarcoma, though low in incidence, give rise to an important number of clinical cases. When to these we add the much larger number of those who have pain and deformity, it will be seen that Paget's disease of bone constitutes, among an ageing population, a medical problem of considerable magnitude.

Summary and Conclusions

A detailed examination of the skeleton was made at 650 necropsies of unselected persons aged 40 or more dying in general hospitals in Leeds and Sheffield.

Pathological lesions of Paget's disease were discovered in 24 cases, an over-all incidence of 3·7%. The result compares with Schmorl's (1932) figure of 3·0% and confirms that Paget's disease, in some form, is very common in persons past middle life.

Further data were compiled from 70 cases of Paget's disease studied pathologically.

Paget's disease is exceptional in people aged less than 40 and uncommon in those aged 40–55.

About 9 out of every 10 cases of Paget's disease are found in persons aged at least 55.

Cases were found in the incidence survey rather more frequently among women than among men, but this is not the general experience, and probably the sexes are affected in about the proportion of 4 men to 3 women.

The commonest anatomical sites of Paget's disease are the lumbar vertebræ and sacrum, which seem to be affected in at least 3 out of every 4 cases, and, after them, the skull and pelvic bones other than the sacrum.

A solitary focus of Paget's disease, affecting a single bone in whole or in part, may be the only lesion in about 10% of cases. It does not necessarily mark an early stage in Paget's disease, for the pathological process in the solitary focus may be in a late stage of evolution. It merely represents a limited involvement of the skeleton. Paget's disease, though usually multifocal, is never diffuse.

Of the 24 cases discovered during the incidence survey only 1 patient had been admitted to hospital as a direct consequence of Paget's disease (fracture of the cervical spine). Only 7 patients had been clinically or radio-

logically diagnosed as cases of Paget's disease while in hospital.

Probably Paget's disease in 2 out of every 3 cases remains throughout life in a subclinical form. In only about a third of all the cases are there physical signs or symptoms of Paget's disease that would lead to its detection in patients under medical care.

In view of the frequency of Paget's disease among elderly persons and its prevalence in subclinical form, the incidence of fracture and sarcoma as complications has always been much overestimated.

Special points in the pathological recognition of Paget's disease are described.

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EARLY DIAGNOSIS OF BONE AND JOINT TUBERCULOSIS IN CHILDREN *

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IT is usually assumed that the most effective use of antibiotics in the treatment of bone and joint tuberculosis depends on early diagnosis. The reason for this assumption is that the early vascular stage of the infection is favourable to a high concentration of the antibiotics in the diseased area, whereas later in the disease scar formation in soft tissue and bone obstructs free access of the antibiotic to the invading organism (Roaf 1954).

The early separation by diagnostic biopsy of the tuberculous from the non-tuberculous cases allows the appropriate treatment for each category to be instituted early. The early exclusion of non-tuberculous patients obviates the danger of submitting a child unnecessarily to a period of immobilisation and the possible harmful effects of antituberculous drugs. In addition, for the purpose of estimating the value of any treatment, it is important that the diagnosis in a series of cases should rest on the firm foundation of bacteriological or histological proof of a tuberculous infection and not simply on a clinical estimation, which is often unreliable.

We do not attempt here to assess the results of treatment but simply describe how the policy of early biopsy was followed and what we learnt from it.

Clinical Material

We report here the investigation of 60 consecutive cases in which biopsy was done. During the period of the survey there were some cases in which the diagnosis was sufficiently obvious to preclude the need for biopsy, and these cases have been excluded. The types of biopsy were as follows:

	No. of cases
(1) Aspiration (either of a joint cavity or an abscess)	26
(2) Regional lymph-node biopsy	39
(3) Joint biopsy (synovial membrane)	31
(4) Bone biopsy	11

The series is divided in three groups:

Group 1, proved tuberculous cases (35).—Biopsy established the diagnosis of tuberculosis beyond reasonable doubt in that the bacillus was isolated (21 cases) or the histology was typical of tuberculosis (32 cases); 6 of the patients in this group had more than one bone and joint lesion. The lesions were distributed as follows: knee 15, hip 10, spine 5, ankle 4, foot 3, greater trochanter 2, sacro-iliac joint 2, humerus 1, and hand 1.

Group 2, non-tuberculous cases (20).—In this group the biopsy and subsequent clinical course ruled out the original suspicion of tuberculosis, the final diagnoses being as follows: non-specific synovitis 6, rheumatoid arthritis 5, Perthes's disease 2, bone cyst 2, low-grade pyogenic arthritis 1, recurrent dislocation of patella 1, syphilitic arthropathy 1, osteoclastoma 1, and chondroblastoma 1.

Group 3, unproved cases (5).—These were 3 lesions of hip and 2 of knee.

Investigations before Biopsy

History and clinical findings.—The duration of symptoms at the time of first observation was found to be short compared with the observations of Smith (1924) and Milgram (1931). In their series the average time before admission was two or three years, with an average of from three to five years before pathological verification. In the present series synovial lesions were usually observed early and primary bone lesions later, the average length of history being two months in synovial lesions and four months in bone lesions. Primary synovial tuberculosis often presented with an acute onset and had a rapid course, thus giving an appearance which could lead to a mistaken diagnosis of suppurative arthritis or of acute rheumatism.

Radiology.—In primary bone lesions the abnormal radiological appearances led to the need for biopsy. In primary synovial involvement biopsy was undertaken early, in line with the general policy, and at a stage before radiological diagnosis could be of value. Most of the spinal lesions were outside the scope of this survey because the diagnosis was sufficiently obvious to exclude the need for biopsy, but in 3 cases in the series biopsy was done: in 1 of them there were three spinal lesions and biopsy of a mediastinal lymph-gland coincidental with a costotransversectomy confirmed the diagnosis; in another of them diagnostic aspiration of a paraspinal abscess disproved the previous diagnosis of a pyogenic infection; and in the 3rd case biopsy of an ankle lesion was positive for tuberculosis and confirmed the diagnosis of the spinal lesion. In 2 cases of bone tumour the provisional diagnosis of tuberculosis was disproved.

Mantoux test.—Of the 35 cases in group 1 the Mantoux test was positive in 34, and was not done in 1. Of the 34 cases 1 showed an initial negative reaction which became positive after two months. In group 2 15 patients

* Originally based on a paper submitted by E. H. S. for the M.Ch. Orth. Lpool degree.

RESULTS OF BIOPSY

Type of biopsy	Group 1		Group 2		Group 3		Total
	Positive	Negative	Positive	Negative	Positive	Negative	
Aspiration of joint	7	2	0	7	0	2	18
,, ,, abscess	6	1	0	1	0	0	8
Lymph-glands	20	2	0	12	0	5	39
Synovial membrane	15	1	0	12	0	3	31
Bone	8	—	0	3	0	0	11
Total	56	6	0	35	0	10	107

gave a negative response to a tuberculin test. The 5 patients with positive reactions were nearing puberty and had a history of contact with a tuberculous person. There were no late Mantoux conversions. In group 3 the Mantoux test was positive in 4 cases. A persistently negative reaction is of great value in excluding tuberculosis. The advent of routine B.C.G. inoculation may in the future limit the usefulness of positive readings.

Blood examinations.—The erythrocyte-sedimentation rate (E.S.R.) was of little diagnostic value. The highest readings were seen in some severe tuberculous infections and in juvenile rheumatoid arthritis. In many cases a normal E.S.R. was present in proved active tuberculosis. The Wasserman reaction was not done routinely but should be used, especially in obscure cases of synovitis of the knee. In one case presenting with a subacute synovitis of the knee the Wasserman reaction was strongly positive and synovial biopsy excluded tuberculosis.

Results of Biopsy

The results of biopsy are shown in the accompanying table.

Aspiration

Aspiration of a joint is valuable where there is a synovial effusion into a joint, such as the knee. It was done in 18 of the 60 cases. (13 knees, 4 hips, and 1 ankle.) Of the 9 cases in group 1, 7 were positive for tuberculosis. The fluid was examined microscopically, cultured, and inoculated into a guineapig in all the cases. A positive result is significant, but a negative result does not exclude tuberculosis. The opportunity to aspirate for confirmation of diagnosis is also present where there is an abscess. 8 patients had abscesses aspirated: in 6 the diagnosis of tuberculosis was confirmed; and of the 2 negative cases one was proved to be non-tuberculous and the other was later proved to be tuberculous, the examination of biopsy material having been inadequate.

Lymph-gland Biopsy

Valls (1933) and Ottolenghi (1933), working independently, were the first advocates of biopsy of regional lymph-glands. The lymphatic vessels of the limbs are arranged in superficial and deep groups. The synovial membranes drain mainly through the deep lymphatics. Normally the hip-joints drain to the intrapelvic (external and common iliac) and the deep inguinal lymph-glands. The other joints of the legs drain to the superficial inguinal and the popliteal lymph-glands. In the arms all the joints except the shoulders drain primarily to the epitrochlear lymph-gland and later to the axillary lymph-glands (Sevitt 1954).

In the present series 39 biopsies of lymph-glands gave 20 positive results and 2 false negative results—i.e., negative reports in cases later proved by other means to be tuberculous.

As regards biopsy of regional lymph-glands in cases of bone lesions, lymphatic vessels drain the periosteum and the subperiosteal layers of bone, and there is therefore a good reason for biopsy of lymph-glands if these tissues are thought to be involved. In the case of deeper bony foci biopsy of lymph-glands is inappropriate because there is some doubt about whether or not lymphatic channels exist in the deeper cortical bone and the cancellous bone of the interior. In any event, in such cases there are other compelling reasons for direct biopsy of the bone. In 2 cases in this series biopsy of regional lymph-glands gave negative results. Both cases have been included in group 3 (unproved cases), but in each there was strong presumptive evidence of tuberculosis.

The danger of a false positive result is remote. Arden and Scott (1947), Gellman (1941), and Seddon (1939) obtained only 1 positive result from 85 biopsies of supposedly normal lymph-glands. False negative results may occur for various reasons. To avoid error it is important to operate on the correct lymph-glands, to dissect carefully, to select for section a lymph-gland which is enlarged and firm, and to make a complete examination of the material by histology (with serial sections from different parts of the lymph-gland), inoculation of guineapigs, and culture. In the case of the 2 false negative results in our series there was neither guineapig inoculation nor culture.

Biopsy of Synovial Membrane

In our hands this has proved simple, safe, and reliable. 31 such biopsies were done. All the wounds healed by first intention. In all the cases that gave negative results a full range of movements was regained except 5 cases of rheumatoid arthritis and a case of malignant chondroblastoma requiring amputation. Prolonged preoperative treatment with streptomycin may alter the histological appearances and cultural characteristics, but shorter periods of streptomycin therapy do not seem to produce false negative results.

16 cases were in group 1 and have been followed for an average of forty-two months. So far 13 of these patients have regained full range of movements (6 hips, 5 knees, and 2 ankles). Of the remaining 3 patients 1 has regained a fair range of movement (1 hip) and the remaining 2 have required arthrodesis.

In 12 of the 16 negative synovial biopsies the results were of such value that, taken together with other evidence, they excluded tuberculosis. The diagnosis was proved by the further clinical course. The remaining 4 patients have not benefited: 3 are still in the unproved group, and the 4th has since been proved, by biopsy of inguinal lymph-glands and by aspiration, to have tuberculosis.

Biopsy of Bone

11 biopsies were done, of which 6 were coincidental with an operation to eradicate a proved or suspected tuberculous focus. The material obtained at operation was the only proof of tuberculosis in 4 of these cases. The 3 negative biopsies were all of great value, proving the diagnosis to be osteoclastoma, bone cyst, and malignant chondroblastoma.

Punch biopsy was not used in this series, because the sample thus obtained may be inadequate, and the opportunity to inspect the lesion and perhaps to curette it is absent.

Unproved Cases

5 cases have been placed in this category:

Case 1.—A girl, aged 20 months, had limped for four days. Movements at her left hip were limited, and radiography showed slight osteoporosis. A Mantoux test was strongly positive. Biopsies of lymph-glands and synovial membrane done at four weeks proved negative on histological examination. A full course of antituberculous chemotherapy was given. At sixteen weeks a metaphyseal focus appeared in the radiographs, and there were changes in the capital epiphysis

suggesting osteochondritis. At follow-up four years later she had normal hip movements, and radiography showed minimal enlargement of the head of the femur and a good joint-space.

Comment.—This is regarded as a case in which a tuberculous lesion in the metaphysis healed with chemotherapy, but the diagnosis is only presumptive. Biopsy of the synovial membrane was negative because the joint had not become infected, and biopsy of the regional lymph-glands was negative because the primary focus was deep in the bone, where there is probably no lymphatic drainage.

Case 2.—A girl, aged 2½ years, had pain in her right hip for three months. There was a family history of tuberculosis. A Mantoux test was weakly positive. Radiography showed gross osteoporosis of the upper femoral epiphysis, and metaphyseal cystic changes appeared later. Biopsy of iliac lymph-glands was done at fourteen weeks but was negative on histological examination. No antituberculous chemotherapy was given. On review three years later hip movements were excellent. There was a slightly cystic appearance in the upper femoral epiphysis.

Comment.—Probably not tuberculosis in view of the excellent and quick recovery in the absence of antituberculous therapy.

Case 3.—A girl, aged 4½ years, was brought with a swollen right knee. Radiography showed osteoporosis in the lower femoral epiphysis; this later crossed the epiphyseal line to involve a small area of the metaphysis. A Mantoux test was strongly positive. Biopsy of lymph-glands was negative. After full chemotherapy the knee became normal.

Comment.—On the radiological signs and strongly positive Mantoux test this case was probably tuberculous, but because of the situation of the lesion biopsy of bone was inadvisable.

Case 4.—A girl, aged 2 years, presented with a painful right knee. Radiography showed a circumscribed destructive lesion of the medial half of the lower femoral epiphysis. At twenty weeks biopsy of lymph-glands and synovial membrane was negative. Mantoux tests were negative throughout. Two and a half years after the onset the girl had full knee movements and no symptoms. Radiographs were normal.

Comment.—The correct diagnosis is unknown but it does not seem to be tuberculosis.

Case 5.—A boy, aged 5½ years, had a painful left hip for nine months. A Mantoux test was positive 1 in 10,000. Radiography showed osteoporosis and diminished joint-space. After protracted immobilisation and chemotherapy the diagnosis was still in doubt. At seventeen months biopsy of synovial membrane and lymph-gland was inconclusive. Three and a half years later there were full hip movements. Radiographs showed enlargement of the head of the femur.

Comment.—This was probably tuberculosis, but positive proof is lacking. The failure to prove the diagnosis in this case was almost certainly due to the late stage at which the biopsies were done after the patient had already received prolonged chemotherapy.

Summary and Conclusions

The results of early biopsy to distinguish between tuberculous and non-tuberculous conditions are described.

The experience gained gives a broad indication of the value of the methods used.

The decreasing incidence of tuberculosis at present underlines rather than diminishes the necessity for early biopsies.

There has been a tendency in the past to say in a perplexing case, "It must be tuberculous." There is less justification for this attitude now than there ever was, and it is hoped that by following a policy of early biopsy the tuberculous or non-tuberculous nature of the condition can be established promptly with a view to effective treatment.

Our mistakes have been mostly in the way of inadequate examination of the material, and we wish to emphasise that in all biopsies the material obtained must be submitted to careful histological examination, culture, and guineapig inoculation.

The information obtained by biopsy is only part of the whole picture, but it is an important part.

We have included in the cases classed as non-tuberculous 6 labelled "non-specific synovitis." It is recognised that this is open to criticism, and that any or all of them might have been synovial tuberculous infections aborted, but in each of the cases so labelled the weight of evidence appeared to support the diagnosis of a non-tuberculous condition.

We wish to thank Mr. F. C. Dwyer and Mr. Robert Roaf for permission to investigate their cases classed as non-tuberculous and for their interest in the preparation of this paper; Dr. E. G. Hall and Dr. G. B. Ockenden for invaluable help with the laboratory examinations; and Mr. Norman Roberts for his help and advice in making this paper presentable.

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REVERSIBLE GLOMERULAR LESIONS IN TOXÆMIA OF PREGNANCY

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ALTHOUGH several post-mortem studies of the kidneys of women dying of eclampsia have been made, there are only isolated reports of the renal pathology in pre-eclampsia. Several workers state that the kidney lesion of eclampsia disappears within a week, but these opinions do not appear to be based on serial histological studies in the same patient.

Our interest was aroused by the fact that clinical differentiation of the various hypertensive states of late pregnancy is often either very difficult or impossible. Biopsy specimens of the kidney obtained at cæsarean section had revealed a singular glomerular lesion in patients with pre-eclampsia. It appeared desirable to explore the field further because information useful in the diagnosis and management of patients with toxæmia of pregnancy might be gleaned thereby.

The development of a safe technique for percutaneous needle biopsy of the kidney has enabled us to study the

CASES OF TOXÆMIA OF PREGNANCY STUDIED BY SERIAL RENAL BIOPSY

Case no.	Age (yr.)	Parity	Gravida	Month of pregnancy when first studied	Blood-pressure (mm. Hg)	Œdema	Proteinuria	Time of second study post partum	Blood-pressure (mm. Hg)	Clinical diagnosis at time of first study
Group I:										
1	22	1	2	9th	160/110	+	7·3*	2½ mos.	130/80	Pre-eclampsia
2	15	0	1	Term	140/110	0	7·2*	7 mos.	130/70	Pre-eclampsia
3	20	0	1	8th	160/100	+	+ + + +	5 mos.	130/75	Pre-eclampsia
4	32	0	2	9th	170/120	+ + +	2·3*	2 mos.	130/75	Pre-eclampsia
5	19	0	1	9th	172/120	0	+	6 days	170/120	Eclampsia
Group II:										
6	24	0	1	7th	220/130	0	3·4*	7 weeks	160/110	Hypertension, pre-eclampsia
7	28	4	5	Term	190/125	+ +	+	5 weeks	150/110	Pre-eclampsia
Group III:										
8	22	1	2	8th	145/100	0	1·0*	6 mos.	145/100	Pre-eclampsia
9	33	3	4	5th	160/100	0	0·0*	9th mo. of pregnancy	160/100	Hypertension
10	23	6	6	9th	165/110	+	+ +	2 mos.	122/88	Diabetes, hypertension

* Grammes per 24 hours.

kidneys of pregnant women with pre-eclampsia both during the height of their disease and after confinement. This preliminary report records observations on the unique pathology of the pre-eclamptic kidney.

Material and Methods

Ten patients with hypertension, œdema, and/or proteinuria in late pregnancy were studied on two occasions (see table). One was studied in the fifth month and again in the ninth month of her fourth pregnancy. The nine other patients were studied during the last trimester and again after confinement. Renal biopsies were obtained post partum by the technique previously described (Kark and Muehrcke 1954, Muehrcke et al. 1955). Since few patients could lie prone in late pregnancy, a modification of the technique was used for the biopsies made during pregnancy.

Results

On the basis of the histological findings in the first renal biopsy these patients are discussed in three groups.

Group I : Cases with Swelling of the Glomerular Tuft

In these five cases the glomeruli were large and almost completely filled their Bowman's capsules. When sections stained with hæmatoxylin and eosin were examined under low magnification, the glomerular basement membrane appeared widened. Careful study of the glomeruli under higher magnification, however, disclosed that this widening was probably due not only to swelling of the basement membrane but also to swelling of the endothelial and epithelial cells. In some glomeruli swelling of the tuft was so pronounced that the capillary lumina were greatly narrowed and were even obliterated in places. As a result most of the glomerular tufts were completely bloodless. In these swollen glomeruli vacuoles were often seen, confirming the impression that there was œdema of the tuft (fig. 1). Most of the vacuoles appeared to be within the cytoplasm of the much swollen cells. When the periodic-acid/Schiff (P.A.S.) technique of staining was used, the area of intense reactivity of the stain was limited to the basement membrane, which appeared thin and delicate. This appearance differs from that in membranous glomerulonephritis, in which the increased deposition of mucopolysaccharide on the basement membrane gives a diffuse increased staining reactivity with P.A.S. and therefore an impression of thickening or of condensation. These changes affected all or almost all the glomeruli in each section to a similar degree. Glomerular hypercellularity was never observed. Slight degenerative changes were observed in the convoluted tubules, but no gross arterial or arteriolar lesions were noted.

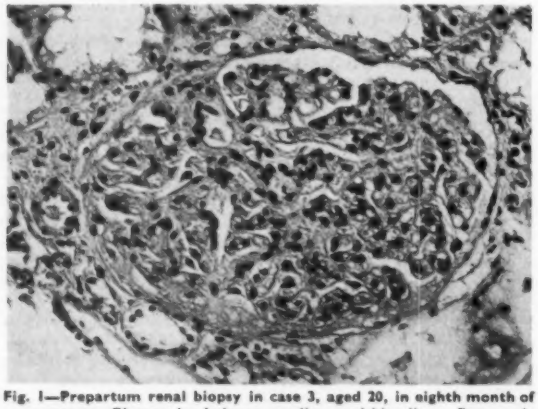

Fig. 1—Prepartum renal biopsy in case 3, aged 20, in eighth month of pregnancy. Glomerulus is large, swollen, and bloodless. Bowman's space is almost completely obliterated and contains proteinaceous material. Note swelling of basement membrane and cells, and much narrowed lumina of capillaries. (Hæmatoxylin and eosin. ×215.)

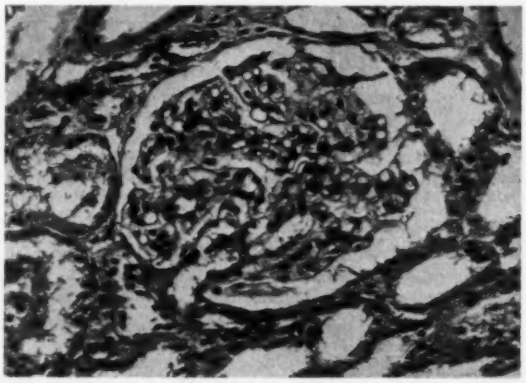

Fig. 2—Postpartum renal biopsy in case 3 three months after delivery. Glomerulus appears entirely normal, basement membrane is thin and delicate, capillary lumina are wide, and Bowman's space is only partially filled by glomerulus. (Hæmatoxylin and eosin. ×215.)

One patient had convulsions—i.e., full-blown eclampsia. The renal lesion was similar to that observed in the other four patients with pre-eclampsia, who did not have convulsions. A second biopsy was made six days after her confinement, and seven days after the first biopsy, when the blood-pressure was still fairly high. The second biopsy specimen showed that the glomerular lesion was unchanged, and that the glomerular tuft was still much swollen.

The four other patients were studied again nine weeks to seven months after the first biopsy. In all of them the lesion in the glomerulus had disappeared, the base-

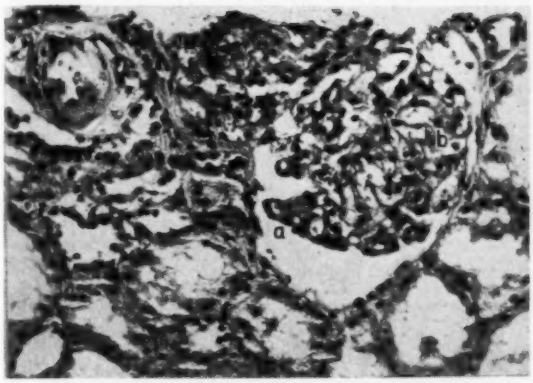

Fig. 3—Prepartum renal biopsy in case 6, aged 24, in seventh month of pregnancy. Glomerulus is normal in size. Note distinct thickening of basement membrane at *a*, mild swelling of tuft and reduction in size of capillary lumina at *b*, and intimal thickening and fibrosis in small artery in left upper corner. (Hæmatoxylin and eosin. ×215.)

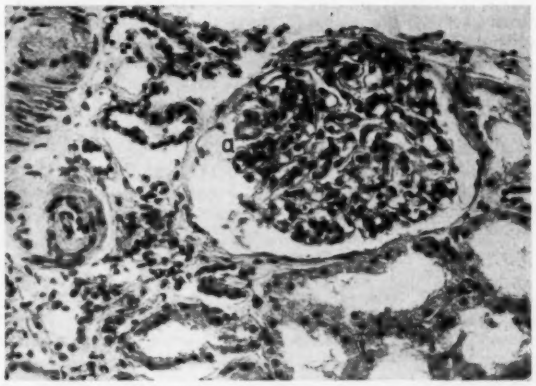

Fig. 4—Postpartum renal biopsy in case 6 seven weeks after delivery. Note mild thickening of glomerular basement membrane at periphery of glomerulus (*a*), no œdema, capillaries only slightly reduced in calibre, and small artery (left) with moderate sclerosis. (Hæmatoxylin and eosin. ×215.)

ment membrane was thin and delicate, and neither swelling of the tuft nor thickening of the basement membrane was observed. The glomeruli were not ischæmic. In one patient slight arteriosclerosis was found, but the blood-vessels were normal in the three other patients. The two biopsy specimens from case 3 are shown in figs. 1 and 2.

Group II : Cases with both Swelling of the Glomerular Tuft and Thickening of the Basement Membrane

Clinically these two patients were indistinguishable from the five in group I. As in group I, a diffuse swelling of the glomerular tuft was seen, all the glomeruli being equally affected. In addition areas of definite thickening of the basement membrane were observed scattered patchily throughout the glomeruli. These areas appeared condensed in sections stained with hæmatoxylin and eosin, and increased staining reactivity was also noted with the P.A.S. technique. With the P.A.S. stain the basement membrane appeared thin, delicate, and linear in the rest of the tuft. A mild but definite sclerosis of the small arteries and arterioles was observed.

These patients were studied again five and eight weeks after confinement. In one the glomeruli were completely normal but mild arteriolar sclerosis persisted. In the second all swelling of the glomerular tuft had disappeared but the thickening of the basement membrane persisted. There was a moderate degree of arteriolar sclerosis in the second biopsy specimen, and this was more severe than in the first. Two biopsy specimens showing these changes are shown in figs. 3 and 4.

Group III : Cases with Predominant Vascular Sclerosis

In three patients vascular sclerosis was the predominant histological feature. In one, a diabetic, there was severe hyalinisation of the glomeruli, and the lesion was unchanged post partum. In another there was moderate thickening of the glomerular basement membrane both during and after pregnancy. Swelling of the glomerular tuft was not observed in either. In the third patient, studied in the fifth and ninth months of her fourth pregnancy, sclerosis of the small arteries was found, but the glomeruli were normal on both occasions. The second biopsy from this patient is shown in fig. 5.

Discussion

The nature of the renal lesion in pre-eclampsia and in eclampsia has been subject to dispute. Fahr (1920) first pointed out that the glomerular basement membrane was widened. Bell (1932), Baird and Dunn (1933), and Allen (1951) have interpreted this widening as the result of thickening of the basement membrane ; but McManus (1950) and Sheehan (1950) have described the lesion as a swelling.

Thickening of the basement membrane is characterised by an increased deposition of mucopolysaccharide. In our experience, when such a change is definitely present the lesion is irreversible—and in conditions such as membranous glomerulonephritis and arteriosclerosis it is often progressive. We have shown that the lesion of pre-eclampsia is not characterised by an increased deposition of mucopolysaccharide on the basement membrane, which is involved in the general swelling and œdema of the glomerular tuft. This lesion, even when severe, has been shown to be reversible to normal after confinement. The one exception to this was in the case studied six days post partum. Since severe hypertension had persisted after delivery, it is probable that enough time had not elapsed for the lesion to return to normal.

In four cases thickening of the glomerular basement membrane was noted at the first renal biopsy. In one it was slight and was not found post partum. In the other three it persisted post partum and appeared to be permanent. Either arterial or arteriolar sclerosis was noted in all these biopsy specimens.

In conclusion, two distinct lesions were found in the glomeruli of women with toxæmia of pregnancy : either generalised swelling of the glomerular tuft or thickening

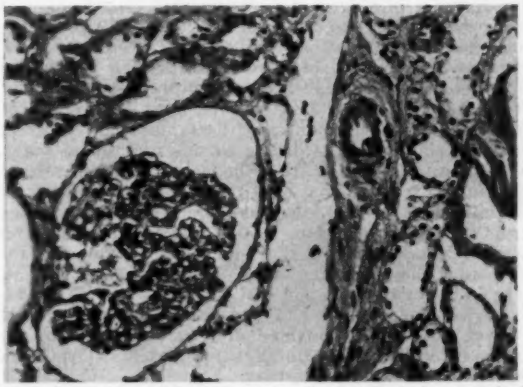

Fig. 5—Prepartum renal biopsy in case 9, aged 33, in last month of pregnancy complicated by hypertension and toxæmia of pregnancy. Note intimal thickening and narrowing of small arteries, but normal glomerulus. (Hæmatoxylin and eosin. ×180.)

of the basement membrane. The latter was associated with vascular changes. These lesions are the probable pathological counterpart, respectively, of pre-eclampsia and of essential hypertension with nephrosclerosis. In a third group lesions of both types were observed and the swelling disappeared post partum. These could be either cases of essential hypertension with superimposed pre-eclampsia or cases of severe pre-eclampsia ab initio producing permanent vascular changes—which process awaits further study.

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DIAGNOSIS OF FOOT RINGWORM

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THERE are no agreed criteria for the diagnosis of foot ringworm. From many patients suspected on clinical grounds of being infected the causal fungi cannot be isolated; and the fungi have been isolated from patients with clinically normal feet. In a survey of foot ringworm in groups of industrial workers in Great Britain (Gentles and Holmes 1955, 1956) it was possible to check the observations of a single clinical observer with those of an independent laboratory worker. We report here our observations, with special reference to the accuracy of diagnostic criteria in common use.

Method

Over 2000 men were selected at random from the payrolls of certain collieries and power stations scattered throughout the country. The men were interviewed personally by the clinician. They were asked a series of standard questions, and their feet were examined for evidence of ringworm. The clinical classification of the patients was based on the type of lesions present—e.g., peeling, maceration, and vesicles. Fourteen headings were used, and these were ranked in a provisional order of importance as suggested by previous experience (table I). Since men often showed more than one type of lesion, for the final analysis it was necessary to select the most important according to this provisional order. Whatever the clinical state of the feet, at least one sample of skin was taken from each foot and sent for mycological examination. Extra specimens were sometimes taken from men with suspicious lesions. At first specimens of nails were taken only if clinically indicated, but towards the end of the survey they were taken from every patient. The mycologist, who did not know the origin of his material until after he had reported on it, cultured part of each sample and examined all or part of the remainder microscopically. The finding of "mosaic" (Weidman 1927) was disregarded.

Results

The response-rate was satisfactory: 97% of the men drawn in the sample of 2101 were seen. The clinician found that 9·5% (201) of the men had normal feet and the remaining 90·5% (1900) had some abnormality of the skin. The mycologist found 21% (438) to be infected; a dermatophyte was cultured from 93%, and 7% were positive on microscopy only. These findings have been correlated in table I. Most of the terms used are self-explanatory, but two comments are necessary: (1) "Peeling and erythema" and "Dermatitis" may be considered as representing different degrees of the same change; and (2) "Maceration and raw areas" might have been better labelled "Maceration and peeling and erythema."

TABLE I—CLINICAL AND LABORATORY FINDINGS (ORIGINAL CLASSIFICATION)

Clinical classification	No. of men	% from whom fungus isolated	Clinical classification	No. of men	% from whom fungus isolated
Normal	201	2·5	Maceration and raw areas ..	70	20
Peeling	533	6	Slight fissures ..	208	23
Erythema ..	10	20	Fissures ..	68	48
Peeling and erythema	78	22	Dermatitis ..	87*	48
Maceration ..	73	8	Dried vesicles ..	89	77
Maceration and peeling	498	9	Broken vesicles	28	64
			Vesicles ..	129	77
			Others ..	19†	..

* Including 2 possible bacterides.
† 8 from whom fungus was isolated: 7 with infected nails, 1 with excoriations. 11 from whom no fungus was isolated: localised purpura 4, ichthyosis 1, chickenpox 1, guttate psoriasis 1, friction blister 1, cracks of heels attributed to cold weather 1 undiagnosed 2.

For practical reasons it was impossible to study nail infections satisfactorily. The problem has been discussed elsewhere (Gentles and Holmes 1955).

The percentage of men from whom fungus was isolated varied between the clinical groups.

Usually the percentage increased from group to group according to the provisional order of importance*; but the importance of maceration was overestimated and that of erythema underestimated.

The number of clinical groups could be reduced considerably (table II). For example, it was unnecessary to subdivide vesicular lesions. (Ormsby and Mitchell [1916] suggested that it was easier to isolate fungus from dried-up vesicles than from those still containing fluid; it has also been suggested that broken vesicles are more liable to secondary bacterial infection, and that consequently cultures from such lesions are likely to be overgrown.)

The fact that extra specimens were sometimes taken from men with "important" lesions must have affected the results to some extent (Sanderson and Sloper 1953), but errors due to this or to variation of specimen size (less than 1% were inadequate for complete laboratory procedure) are not likely to be serious (Gentles and Holmes 1955).

There were no very definite clinical differences between most of the lesions attributable to *Trichophyton rubrum* and most of those associated with *T. mentagrophytes* (Gentles and Holmes 1955). This is contrary to the experience of many hospital workers but was noticed in another survey (Hopkins et al. 1947). There are

TABLE II—CLINICAL AND LABORATORY FINDINGS (AMALGAMATED GROUPING)

Group	Clinical state	% with positive lab. report
I	Men with normal feet	2·5
II	Men with peeling and/or maceration	7·5
III	Men with erythema or peeling and erythema, maceration and raw areas or slight fissures	22
IV	Men with fissures or dermatitis ..	48
V	Men with vesicles	75
VI	Others	—

apparently differences between the two species, however, as regards the quantity and distribution of hyphæ in the tissue (Gentles and Holmes 1955, Gentles and Dawson 1956).

Clinical and Laboratory Criteria

Observer Error

Before our results could be compared with those of other workers it was essential to check the accuracy of our work. Between visits to pits we checked our findings against each other. Often when the mycologist had been unable to isolate a dermatophyte from a man clinically suspected of having foot ringworm, it was possible to examine surplus material. Out of 98 such examinations only 1 extra case was detected. The clinician, however, was unable to perform any such check and had to make a special series of investigations.

Three groups of men numbering 30, 34, and 35 (total 99) were examined twice. The first time the men came through in any order and the second time in a random order, the key of which was unknown to the clinician until afterwards. The men sat behind a screen so that only their legs could be seen. At the first set of examinations 18 were found to have normal feet and 81 some abnormality; at the second examination the figures were 20 and 79 respectively. 93 men were classified the same way each time, 16 having normal feet and 77 having abnormal feet. The degree of abnormality was harder to assess: 63 (about two-thirds) of the men were recorded the same way each time, 16 were coded as having a more severe lesion the first time, and 20 the second time. This degree of error was to be expected because the changes seen were not clear-cut. The problem is comparable to that of reading chest radiographs; unfortunately it is impossible to carry round "standard feet" (Fletcher and Oldham 1951).

TABLE III—EFFECT OF EXPOSURE ON CLINICAL AND LABORATORY FINDINGS

Clinical group	Men with no history of communal bathing		Men with a history of communal bathing	
	No. of men	% from whom fungus was isolated	No. of men	% from whom fungus was isolated
I	78	0	123	4
II	328	2	776	10
III	59	3	317	26
IV	15	20	140	51
V	11	27	235	77
VI	4	25	15	47
Total	495	3	1606	26

General

It might be supposed that, if the clinician and the mycologist were both consistent, the percentage of men with a given clinical classification from whom fungus could be isolated would not change. It would then follow that, once the clinical classification and the correct set of ratios had been agreed on, costly and time-consuming laboratory investigations could be dispensed with in future surveys. This argument is based on the false supposition that both the clinical changes seen and the chances of isolating a dermatophyte depend solely on the quantity of fungus present. No account is taken of host susceptibility, variation in the virulence of the fungi, and the facts that ease of isolation varies with species, degree of contamination, and whether or not the patient has been previously treated, and that similar clinical manifestations may be produced by bacterial infection, sweat, friction dermatitis, and so forth (Whitfield 1911, Nickerson et al. 1945, Hopkins et al. 1947, Dowling 1949).

Table III shows that there is no fixed ratio: for any given clinical finding, men with a history of using communal baths in industry or the Forces or in both have a higher prevalence-rate.

Discussion

A clinical diagnosis of foot ringworm is rarely possible. Which clinical changes suggest ringworm and which do not is a matter of opinion. We suggest that vesicles and erythema are the two most valuable signs, whereas maceration and peeling are unreliable.

The laboratory diagnosis is more straightforward. Although one or two negative laboratory reports do not exclude the possibility of infection, we believe that this difficulty has been exaggerated.

The patient, however, is not interested in laboratory reports but in the condition of his feet; therefore it is essential to consider both findings together. If this is done, men may be divided into the four following groups:

(1) Men suspected by the clinician and proved by the mycologist to be infected; in most of such cases the fungus may be assumed to be parasitic.

(2) Men not suspected clinically but nevertheless proved to be infected. Here possibly the fungus is saprophytic; or the infection is in an early stage; or host resistance is preventing clinical manifestation.

(3) Men suspected clinically but not proved to be infected. A few of these men may be infected, but ringworm is not the only cause of eczema of the feet.

(4) Men not suspected clinically and not proved to be infected. We believe most of these men to be free from ringworm fungi.

When laboratory facilities are not available, it is tempting to make a diagnosis in retrospect, on the response to treatment. Many fungicides are, however, non-specific in their action and act as general antiseptics (Hopkins et al. 1947), and all attempts at treatment are likely to produce improvement in hygiene of the feet. Improvement with treatment is not evidence that the diagnosis was correct; nor does failure to respond to treatment mean that the condition is not due to fungus.

Since there is no constant association between the clinical findings and prevalence-rates of fungal infection, we believe that foot ringworm can be diagnosed only when clinical symptoms can be supported by isolation of a dermatophyte or by recognition of the fungal hyphæ on microscopy.

Summary and Conclusion

During an epidemiological survey of foot ringworm it was possible to compare the accuracy of the clinical and of the laboratory diagnosis of foot ringworm. Although the classification of patients into broad clinical groups can be done with fair consistency, laboratory confirmation of the clinical diagnosis is essential. This applies both to survey work and to clinical practice.

This work was done under the direction of the Committee for Industrial Epidermophytosis of the Medical Research Council: Dr. J. T. Ingram (chairman), the late Dr. J. B. Adamson, Dr. G. C. Ainsworth, Dr. A. L. Cochrane, the late Dr. T. E. Howell, Prof. G. H. Percival, Dr. D. D. Reid, Dr. J. M. Rogan, Dr. H. R. Vickers, and Dr. B. S. Lush (secretary). The data formed part of a thesis by one of us (J. G. H.) and of a paper read by him at the annual meeting of the British Association of Dermatology in July, 1955.

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RUBELLA IN A REMOTE COMMUNITY

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THE isolated community has advantages for the study of infectious diseases (Isaacs et al. 1950, Christensen 1952). The people are relatively accessible; their isolation makes it easier to estimate incubation periods, epidemic periodicity, and immunity; and, as other infections are less likely to be present, the clinical picture may be observed in pure form.

The Falkland Islands had outbreaks of rubella in 1911–12 (when it was almost pandemic, attacking a high proportion of adults, and even old people) and again in 1947–48 when the epidemic was overlapped by an equally extensive epidemic of measles.

The further outbreak I describe here was confined to the Colony's chief settlement, Port Stanley, whose population is entirely white and largely of British descent. It began seventeen days after the arrival of the monthly mail-cum-passenger boat from Montevideo on Sept. 7, 1952. None of the passengers reported sick, and the first case was seen in a Port Stanley schoolboy. Most of them occurred during the first two months; but a second crop followed Christmas gatherings, and after this there were still a few scattered cases. No other infectious fever was current at the time.

Epidemiology

As in 1911–12 and 1947–48, the time of the outbreak was spring, as is usual also in the Northern Hemisphere (Paterson and Moncrieff 1949). In isolated communities infectious diseases do not, as a rule, return until a new generation of non-immune persons has grown up. This would account for the absence of rubella between 1911 and 1947; but the shortness of the interval between 1947 and its reappearance in 1952 is not easily explained.

Second Attacks

When, as often happened, patients with rubella in 1952–53 gave me a history of rubella in 1947–48 I was inclined to think that they had confused german measles with true measles, of which there had been an outbreak at about the same time: of 33 women who became pregnant during the epidemic of 1952–53, 15 claimed to have had rubella earlier on. However, there were 107 school-children whose medical records showed that they had both measles and rubella in 1947–48, and of these no fewer than 15 developed clinical rubella and 6 subclinical rubella, in 1952–53.

Age and Sex

The age-range was wide, with 7 infants under 6 months of age (10, 14, 21, and 23 days, 5 weeks, and 3 and 5 months) and a considerable number of adults over 40, the oldest being 57; in the case of the youngest infant transplacental infection despite maternal immunity (Schick 1949) is possible. The only substantial risk from the disease is in pregnancy, and it is noteworthy that in the age-group 15–45, when women are fertile, far more females than males contracted the disease (table I). This difference, which has been observed elsewhere (Clayton-Jones 1947, *Lancet* 1952), cannot be fully explained on the ground that under 15 years of age boys contracted it more often than girls, and thus acquired immunity. Another explanation is that in families the infected children tend to infect the mother rather than the father (demonstrated for the common cold by Heasman 1955). Or it is possible that, as with poliomyelitis, pregnancy makes a woman more likely to contract rubella (Lundström 1952). Comparison of attack-rates in pregnant and non-pregnant women is required to show whether this is so. Lastly, women may have sought medical advice more often than men; for the symptoms were trivial and my clinics were mostly held during the men's working hours.

TABLE I—144 CASES OF RUBELLA IN FALKLAND ISLANDS, 1952-53 AGE AND SEX DISTRIBUTION

Age (years)	Male	Female
Under 1	9	4
1–4	5	7
5–14	45	34
15–45	6	28
46–57	4	2
Total	69	75

Clinical Picture

Usually the illness was mild and presented no diagnostic difficulty. The prodromata, which were rarely conspicuous, took the form of aches and pains. In most cases the rash was characteristic of rubella both in site and in appearance, but in some it was rudimentary, particularly on the exposed weather-beaten parts of the body. The duration of the rash varied from an hour to several days: as a rule it lasted one or two days, often fading towards evening and reappearing after rest in bed or a hot bath, as observed by Rundle (1929). Following the rash, a branny desquamation was observed in 2 patients.

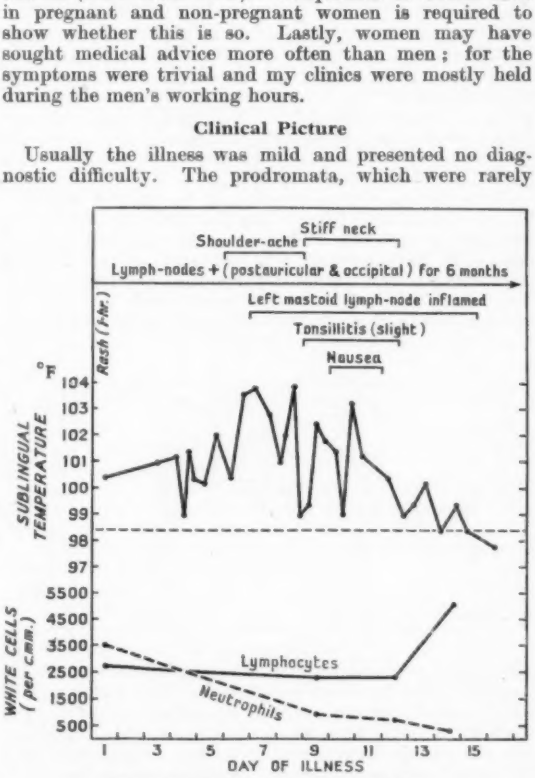

Chart of severe rubella in girl aged 17.

About a third of my cases were of "non-eruptive rubella" (Paterson and Moncrieff 1949, Dods 1951). These subclinical infections were seen because I frequently examined whole families, but no doubt some of the patients had had a fleeting rash. Pyrexia was, with a few exceptions, mild or absent; conjunctivitis was rarely seen and photophobia only once; a mild tonsillitis was present twice (once accompanied by vomiting and a second attack of pyrexia: see chart), and in one patient the spleen was enlarged. Both in clinical and in subclinical infection the postauricular, and almost always the occipital, lymph-nodes were enlarged at an early stage: in 2 cases the postauricular lymph-nodes were inflamed, though they did not suppurate. Less frequently the supratrochlear, axillary, and inguinal groups were involved. In most cases the lymph-nodes were enlarged for up to seven months, and in many for over a year.

Relapses

In 3 cases relapsing infections (Wesselhoeft 1951) were observed, occurring ten weeks and five and seven months after the first attack: 2 were clinical on both occasions, while in the 3rd, with an interval of five months, the first infection was subclinical.

Outcome of Pregnancies

As in 1947–48, many congenital malformations followed this outbreak, though the majority of the women had shown no clinical infection. There was also a considerable number of premature births and stillbirths, as has been observed elsewhere (Swan 1948). Of the women with a history of rubella in 1947–48 who were again exposed during pregnancy, 3 had babies with defects (Bamatter 1949, 1951) (1 mother subclinically infected at the third month), 1 had a premature birth and 1 had stillbirth. The outcome of pregnancy in all pregnant women in Port Stanley during the epidemics of 1947–48 and 1952–53 are shown in table II. In years when other infectious diseases were prevalent in the town the only evidence of damage to offspring is a single miscarriage (table III).

My departure from the Colony in May, 1954, prevented my obtaining data regarding further deformities (particularly congenital deafness).

Rheumatism

The presence of fibrositic "trigger points" is now recognised as fairly common in rubella (Copeman 1954);

TABLE II—OUTCOME OF PREGNANCIES

Women exposed to rubella during pregnancy	Infants: No.	Infants: Normal	Infants: Neonatal rubella (age in days)	Infants: Congenital defects	Premature births	Stillbirths	Miscarriages
1952–53 Epidemic							
Clinical rubella: 14th week	1		23	..			
Subclinical rubella: 3rd month	1			1 Cardiac lesion: death			
8th month	1		35	..			
Rubella diagnosed hæmatologically only	8	1	10	1 Left cataract and microphthalmos 1 Cardiac lesion: death 1 Imbecile: fontanelle closed	1 1 (death)		1
No data regarding infection, but exposed	18	12	21 14	1 Hydrocephalus 1 Imbecile 1 Strabismus 1 Premature closure of fontanelle			
Preconception rubella 24 days before conception	1			1 Premature closure of fontanelle			
16, 19, and 20 weeks before conception	3	3		..			
1947–48 Epidemic							
Clinical rubella:							
1st month	2						2
2nd month	1			1 Dental defects			
5th month	1			1 Cavernous hæmangioma			
7th month	1			1 Stammering: dental defects			
9th month	1	1		..			
10th month	5	2		3 Under 6 lb.			
No data regarding infection, but exposed	9	1		1 Stillborn: fontanelle closed 1 Stillborn: hydrocephalus 1 Cavernous hæmangioma 1 Strabismus 1 Talipes	1 (death)	1	1

TABLE III—EPIDEMICS OF INFECTIOUS DISEASES AT PORT STANLEY AND BIRTHS DURING YEAR AFTER THEIR ONSET

Disease	Period	Total population	Recorded cases	% affected	Births: Total	Births: Defects	Births: Stillborn	Births: Premature	Births: Miscarriages
Measles	1905–06: Dec.–Feb.	860	196	23	55	..	..	..	..
Rubella	1911–12: Sept.–Jan.	880	*	50*	52	1	4	1	..
Measles	1925: from June	1080	463	43	29	..	..	..	..
Mumps	1946: Jan.–June	1252	129	10	38	..	..	..	1
Measles	1947: Aug.–Dec.	1230	391	31	..	..	..	..	..
Rubella	1947–48: Sept.–Jan.	1230	146	11	33	9†	3	..	3
Rubella	1952–53: Sept.–Jan.	1135	144	13	46	10†	..	1	1

Reference: Medical and Sanitary Reports, Port Stanley.
* It was estimated that 50 % of households were affected. "Surprisingly high number of middle-aged and even old people."
† Listed in table II.

but in the 1952–53 outbreak other rheumatic symptoms were prominent. 25 patients showed muscular rheumatism, which was usually at the onset but in 7 was prodromal and in 4 came on long after the acute stage. General or localised aching in the backs and calves, and less frequently pains in the joints, were complained of. A transient arthritis with painful swelling of the middle finger, knee, wrist, or ankles was seen in 15 patients with clinical or subclinical rubella. 2 patients had exacerbations of prepatellar bursitis, and 1 of an old injury to the knee. Also 3 patients with osteo-arthritis of long standing had exacerbations at the height of the epidemic: they showed neither clinical nor subclinical rubella but had blood changes suggestive of this infection. Similarly, rheumatoid arthritis was observed in 5 adult women during the outbreak: of these, 2 had their exacerbation during the onset of clinical rubella, 1 had it during subclinical infection, and 2 showed no infection but had characteristic blood changes. Erythema nodosum was seen in 3 adult patients (2 with osteo-arthritis and 1 with arthralgia of the knee). In 1 of these a concurrent chest lesion might have provoked the syndrome, but all 3 showed the blood changes.

Comparative Studies

After my return to England in 1954, I was able to make some observations on children with rubella in a hospital in London.

Of 88 patients, 3 had a medically recorded history of rubella in the same hospital in 1951–52. Subclinical infections were seen in 5 and there was one relapsing infection within fifteen days of the original attack, with rash on both occasions. 2 girls showing congenital defects and a history of maternal rubella in early pregnancy (Kirman 1955) contracted rubella in 1954: 1 of them had a sister, four years younger, similarly deformed.

It has been shown that intra-uterine infection with rubella, though potentially destructive to various organs, does not result in a generalised disease of the fœtus (Töndury 1953).

Summary

An outbreak of rubella observed in 1952–53 in the Falkland Islands differed in several ways from the usual pattern.

It attacked people over a wide range of age, and in the age-group 15–45 many more females than males were affected.

Other outstanding features were: relapses; presumed second attacks; many subclinical infections; and an unusually high incidence of a variety of rheumatic afflictions. Enlargement of lymph-nodes was found to persist for many months.

Pregnancies starting during the epidemic resulted in a number of congenital defects and other sequels similar to those reported elsewhere.

I wish to thank H.M. Colonial Government of the Falkland Islands and the Senior Medical Officer, Port Stanley, for facilities for studying the epidemic, and Dr. J. H. Edwards for his help during and after my stay in the Colony. I am also grateful to Dr. B. Kirman for his support and advice.

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THE BLOOD PICTURE IN RUBELLA

ITS PLACE IN DIAGNOSIS

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RUBELLA in the first three months of pregnancy may produce heart lesions, cataract (Gregg 1941), deafness, and other deformities in the offspring (Swan et al. 1943, Swan 1948). Women at this stage of pregnancy must therefore be protected from infection; and since, owing to the long incubation period and high infectivity, segregation is seldom effective, passive immunisation may be required (*British Medical Journal* 1956). The usefulness of such immunisation will depend on its being undertaken in good time; and for this reason early diagnosis of rubella can be very important.

Diagnosis by clinical methods alone is not infrequently difficult. The rash may resemble those of mild scarlet fever, infectious mononucleosis, and abortive measles. As it may be of very short duration, it may pass unnoticed; or there may be no rash at all. Subclinical rubella without rash is likely to be missed unless there is an epidemic or a concurrent typical case in the same family.

As an aid to diagnosis, the blood-cell changes in rubella have been considered helpful (Whitby and Britton 1953); but there has been no general agreement on their difference from those seen in measles. My interest in them was aroused many years ago when I examined the blood of patients with persistent enlargement of postauricular and occipital lymph-nodes following rubella and found that it regularly showed plasmacytosis. Accordingly, when an opportunity arose during the Falkland Islands epidemic of rubella in 1952–53 I made routine white-cell and differential counts in cases both clinical and subclinical, including, of course, women who had become pregnant during the outbreak. The absence of any other infectious fever on the island at the time, and the accessibility of the cases, made conditions favourable for such observations.

On my return to England these studies were extended. At that time (August, 1954, to September, 1955) there was no major epidemic in the London area, and all observations had to be made on patients in hospital—mostly children. The follow-up period was shorter, but, on the other hand, considerably larger numbers could be examined at early stages of infection.

Methods

Most of the white-cell counts were made in the forenoon, the time being noted. The blood-films were stained by Pappenheim's panoptic method and differentiated by Schilling's method, 100 cells being counted. Absolute numbers were calculated throughout. In judging whether the white cells were increased or decreased the standards of Whitby and Britton (1953) were used:

Age	Total white cells			Neutrophils			Lymphocytes		
	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.
12 days–1 year	15000	9000	18000	4500	2700	5250	8250	5000	10500
1–2 years ..	12000	6000	15000	3600	1800	5400	6000	3000	7200
3–5 years ..	10000	6000	15000	4000	2400	5500	4000	2400	5500
6–8 years ..	8000	6000	15000	3800	2700	4800	3300	2400	4000
9–12 years ..	7000	4500	13500	3500	2250	4200	2300	1500	2800
Adults ..	7000	4000	11000	3800	2200	5250	2100	1200	2700

White cells were classified as "increased" or "decreased" according to whether they were above or below Whitby and Britton's maximum and minimum for the total age.

Comparable observations were made in London on infections sometimes confused with rubella.

Results

Rubella

The initial neutropenia and lymphopenia described by Carroll (1934) and Hynes (1940) was seen in rather less than half the cases, both in London and in the Falkland Islands, but lasted longer than these authors report. At later stages lymphocytosis was infrequent and polymorphonuclear leucocytosis almost absent (table I).

In clinical and subclinical infections alike, the outstanding feature was the regular occurrence of Türk and plasma cells, which in uncomplicated rubella were invariably present up to the tenth day, and usually persisted for many months. The maximum percentages of these cells observed in single specimens were:

Falkland Islands: 14 (third day) (Türk and plasma cells) 8 (sixth day).

London: 19 (fourth day) (Türk and plasma cells) (Carroll 1934).

The increase in monocytes noted by Glanzmann (1929), Carroll (1934), and MacBryde and Charles (1935) was confirmed, the percentage amounting to 18 (London) and 16 (Falkland Islands) on several occasions. Bilobed monocytes (Whitby and Britton 1953), numerous in both groups, were not registered separately.

Next I would draw attention to the degenerate lymphocytes occurring, independently of age, in examples of clinical and subclinical infection from both groups. These large cells, about the size of monocytes, often show an eccentric (sometimes nucleolated) nucleus: the cytoplasm stains clear, pale, and light-blue and may show vacuoles and azure-staining granules. They are quite distinct from large lymphocytes or those deformed during the film-taking or staining; and they differ also from the abnormal monocytes of infectious mononucleosis. Though found at all stages of rubella infection they are commonly a late feature, their appearance coinciding with the diminution of the Türk and plasma cells though they show no morphological relationship with these. Usually few (Kamerbek 1949) in both London and Falkland Islands specimens, they were sometimes increased (maximum percentages: Falkland Islands 22 fifteenth day, London 16 eleventh day). They have been observed in other conditions (Schilling 1935), but not in infectious mononucleosis.

Basophils, inconstant in the London series, were occasionally numerous at late stages, up to a maximum of 420 per c.mm. in the Falkland Islands group. A slight initial increase in eosinophils (Glanzmann 1929, Carroll 1934, MacBryde and Charles 1935) was also observed in the Falkland Islands group. Metamyelocytes were found in insignificant proportions and were almost confined to blood from infants (MacBryde and Charles 1935).

The initial increase of stab-cells was not as impressive as in the studies of MacBryde and Charles (1935). It was seen more often, and reached a higher level, in the London group, partly no doubt because this included 15 mongols.

Apart from lack of lobulation of some of their polymorphs, which led to these being registered mainly as "stabs" (Shapiro 1949), the blood pictures of these mongols differed in no way from those of other rubella subjects. In 5 an eosinophilia (Manitz 1932) up to 9% was recorded.

These blood changes were usually still evident several months after the attack (table II).

Differential Diagnosis

Measles

The presence of Türk and plasma cells does not by itself prove the illness to be rubella rather than measles. But measles is unlikely if the blood shows the full rubella picture:

1. Monocytes, Türk cells, and (especially) plasma cells, abundant.
2. Lymphocytes and neutrophil leucocytes reduced.
3. Stab-cells little increased.
4. Metamyelocytes scarce.
5. Degenerate lymphocytes present.

Toxic granulation of neutrophils (Whitby and Britton 1953), which is fairly often noted in measles, has been very rarely seen by me in rubella.

Scarlet Fever

The 16 blood-films from patients with mild scarlet fever showed the characteristic changes (MacBryde and Charles 1935)—eosinophilia up to 11%, early increase of stab cells, and toxic granulation of neutrophils. The presence of Türk cells, but not of plasma cells, in most of the specimens from small children with scarlet fever should help in distinguishing between this disease and rubella.

TABLE I—NEUTROPHILS, LYMPHOCYTES, AND PLASMA CELLS IN RUBELLA AND SOME OTHER CONDITIONS

Disease and period between onset and examinations	No. performed	No. of examinations showing: Neutrophils: Normal	Neutrophils: Reduced	Neutrophils: Increased	Lymphocytes: Normal	Lymphocytes: Reduced	Lymphocytes: Increased	Türk and/or plasma cells
FALKLAND ISLANDS								
Clinical Rubella:								
1–9 days	36	16	20	..	25	9	2	36 (100%)
10 days–6 weeks	25	12	13	..	20	3	2	25 (100%)
7 weeks–9 months	72	49	21	2	58	10	4	52 (70%)
10–14 months	49	35	14	..	34	7	8	23 (47%)
Total	182							
Subclinical rubella:								
1–9 days	5	5	..	..	4	..	1	5 (100%)
10 days–6 weeks	10	6	4	..	7	..	3	9 (90%)
7 weeks–9 months	24	22	2	..	22	1	1	20 (83%)
10–14 months	24	19	5	..	18	4	2	14 (59%)
Total	63							
LONDON								
Clinical rubella:								
1–9 days	144	106	33	5	115	18	11	144 (100%)
10 days–6 weeks	86	68	13	5	31	27	28	72 (83%)
7 weeks–9 months	31	24	4	3	23	4	4	26 (83%)
Total	261							
Subclinical rubella:								
1–9 days	12	7	4	1	6	4	2	12 (100%)
10 days–3 weeks	8	3	5	..	6	1	1	7 (87%)
Total	20							
Measles:								
1–9 days	45	23	13	9	20	21	4	42 (94%)
10–23 days	19	7	1	11	10	3	6	7 (38%)
Scarlet fever:								
2–9 days	11	7	..	4	3	7	1	6 (55%)
10–28 days	5	3	..	2	2	3	..	3 (60%)
Infectious mononucleosis	16	13	3	..	6	1	9	4 (25%)
Rheumatoid arthritis	12	12	..	..	10	2	..	0 (0%)

TABLE II—DIFFERENTIAL COUNTS IN RUBELLA AND SOME OTHER CONDITIONS

Disease	Period from onset	No. performed	No. of examinations showing*: Basophils	Metamyelocytes	Stab cells	Degenerated lymphocytes	Türk and/or plasma cells
Rubella							
Falkland Islands:							
Clinical	1–9 days	36	11	5	23	23	36
	10 days–6 weeks	25	9	3	17	14	25
	7 weeks–9 months	72	24	3	41	49	50
	10–14 months	49	23	..	37	40	23
Subclinical	1–9 days	5	4	..	2	3	4
	10 days–6 weeks	10	4	1	5	6	8
	7 weeks–9 months	24	11	..	17	18	21
	10–14 months	24	11	..	22	19	13
London:							
Clinical	1–9 days	144	3	9	122	34	143
	10 days–6 weeks	86	5	3	58	17	72
	7 weeks–9 months	31	1	4	23	7	26
Subclinical	1–9 days	12	..	1	6	3	12
	10 days–3 weeks	8	..	1	5	1	7
Measles	1–9 days	45	3	13	38	1	42
	10–23 days	19	..	3	11	1	7
Scarlet fever	2–9 days	11	..	..	11	..	6
	10 days–4 weeks	5	..	..	5	..	3
Infectious mononucleosis	2 days before	1	..	..	1	..	..
	1–9 days	12	..	2	11	..	4
	14th, 16th, 26th days	3	1	..	1	..	..
Rash in other conditions:							
Measles plus chickenpox	1st and 4th days	1	..	..	1	..	..
Drug sensitivity	2nd day	1	..	..	1	1	..
Pyelitis	2nd day	1	1	..	1	..	..
Dyspepsia	2nd day	1	..	1	1	1	..
Rheumatoid arthritis	2 months to 13 years	12	..	..	12	..	..

* Monocytes were found in all examinations, and eosinophils were seen in all cases except the one made two days before the onset of infectious mononucleosis. In 13 of the 16 cases of this disease abnormal monocytes were observed.

Infectious Mononucleosis

All the examinations made during the first week, at the height of the illness, showed lymphocytosis and an abnormal monocytosis (in one case reaching 8832 per c.mm.). 4 examinations made early and late (1 prodromal, 1 first day, 1 sixteenth day, and 1 twenty-sixth day from onset) showed normal blood pictures.

Türk and plasma cells were seen on 4 occasions only, during the first week, the highest percentage (of both combined) being 5.

As regards the hæmatological differential diagnosis of rubella and infectious mononucleosis, it may be mentioned that the Paul-Bunnell test taken in 8 patients was positive in 7. It is never positive in rubella. Lymphocytosis was marked in infectious mononucleosis and uncommon in rubella. High total white counts were always present at the height of infectious mononucleosis and always absent in the numerous cases of uncomplicated rubella. Abnormal monocytes (Whitby and Britton 1953) were characteristic for infectious mononucleosis but absent in rubella. On the other hand, "degenerate lymphocytes" (vide supra) were seen in rubella but not in infectious mononucleosis. In rubella, plasmacytosis was conspicuous, appearing early and continuing for a long time, whereas in the small number of patients with infectious mononucleosis examined, Türk and plasma cells were found only in small percentages and during the first week of the illness. Finally, the abnormal monocytes characteristic of infectious

mononucleosis, and the degenerate lymphocytes seen in rubella, may be distinguished as follows:

Abnormal monocyte.—Nucleus oval, reniform, or horseshoe-shaped, may be placed somewhat eccentrically. Cell edges may be irregular. Cytoplasm stains bluish-grey.

Degenerate lymphocyte.—Nucleus most often oval and placed eccentrically. May have nucleolus. Cytoplasm stains clear, pale, light-blue.

The two kinds of cells are alike in their size, their vacuoles, and the azure granules in their cytoplasm. But, though their size is always large (about that of a normal monocyte or large lymphocyte) the vacuoles and azure granules may be absent.

Rheumatoid Arthritis

The blood findings in the 12 cases examined were quite unlike those of Falkland Islands patients who had arthritis with rubella. It should be mentioned that, for a considerable time before the blood-counts were made, they had had no antirheumatic drugs except salicylates.

Incidental Blood Changes in Rubella

Only very rarely have I seen rubella with leucocytosis but without Türk and plasma cells; and presumably such cases could be explained by some obvious minor intercurrent infection. In follow-up examinations of these patients plasmacytosis was observed—the infection or other factor responsible for the leucocytosis being no longer present.

For example, a leucocyte-count of 27,600 per c.mm., with absence of Türk and plasma cells, was seen in a schoolgirl with a fractured clavicle. Ten days later she had neutropenia with plasma cells.

Attenuation of measles and scarlet fever by injection of serum (Birkhaug 1925, Vaughan 1932) is said to restore the blood picture to normal. But a small number of London children who developed rubella after receiving gamma-globulin (McDonald 1954) during a large trial had the same characteristic blood changes of rubella as those who had not received it.

Leucocytosis is regarded as physiological in late pregnancy and the early puerperium (Whitby and Britton 1953). Accordingly, Falkland Islands women who had become pregnant during the epidemic were examined after their discharge from hospital. A "rubella-positive" blood picture was obtained in 1 woman who had had clinical rubella, 2 who had had subclinical infection, and 8 who had had no signs or symptoms but had been exposed.

Conclusions

In conjunction with lymph-node enlargement the results of routine white-cell counts are sufficiently characteristic in rubella to permit a confident diagnosis in cases even of subclinical infection, in which symptoms may pass unnoticed.

This aid to early diagnosis can be very important when (as often) it is necessary to protect a pregnant woman, who has been exposed to the infection, by passive immunisation.

The lymphatic hyperplasia—mainly of the postauricular and occipital lymph-nodes—which typically follows rubella, and may persist for many months, is associated with the presence of Türk cells and plasma cells in the blood. When persistent lymph-node enlargement is associated with these blood changes, a retrospective diagnosis of rubella can be made.

The fact that all cases of rubella (clinical or subclinical) examined between the first and ninth days showed plasma cells or Türk cells, which nearly always persisted until the sixth week, means that a person not showing these changes is very unlikely to have had rubella. In their absence, therefore, there is no need to fear damage to the offspring of a pregnant woman or to consider the advisability of therapeutic abortion (Dods 1951).

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MAINTENANCE OF RESPIRATORY FUNCTION IN POLIOMYELITIS AND OTHER NEUROMUSCULAR DISORDERS

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DURING 1955 there was a considerable rise in the incidence of poliomyelitis in this country. Though the numbers did not reach the 1947 peak, many more patients with respiratory complications were admitted to the Western Hospital than in previous years. This was largely due to the continued development of our unit for the treatment of complicated cases. The centre was equipped with mechanical aids to respiration, including cabinet respirators of various designs, cuirass respirators, apparatus for intermittent positive-pressure respiration (I.P.P.R.), and rocking beds. Rapid developments in equipment during the past two or three years and recent new ideas for assisting respiration made it hard to choose a well-balanced armamentarium. The Danish experiences of 1952–53 (Lassen 1953) were responsible for many changes: Lassen's team developed the revolutionary methods of prolonged or indefinitely maintained I.P.P.R. through a tracheostomy. They used a cuffed rubber tube in the trachea and pressure insufflation with the manually compressed rubber bag providing a mixture of 50% oxygen and 50% nitrogen from gas cylinders. Lassen found the method had considerable advantages and much reduced mortality in the serious bulbospinal cases. Observers of the Danish method (Kelleher and Sellick 1953) suggested that it should be more closely studied, and a wide interest was aroused in this country by the Ministry of Health's prompt action. Confirmation of the Danish claims was not forthcoming in the U.S.A. where, however, tracheotomy for complicated cases was strongly supported by Bower (1949) and by Galloway and Seiffert (1949); in their method respiration was maintained by a cabinet respirator. Kelleher (1951) strongly advocated a closer study and practice of tracheotomy as carried out in the U.S.A.

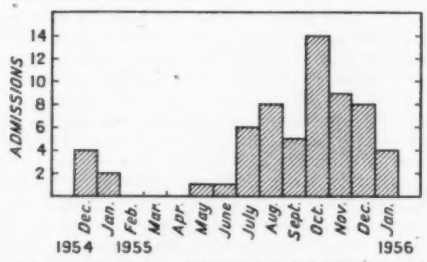

Fig. 1—Distribution of admissions to the respiratory unit between December, 1954, and January, 1956 (poliomyelitis only).

Patients and Techniques

70 patients were admitted to the respiratory ward of the poliomyelitis unit between December, 1954, and the early part of January, 1956. The criteria for admission were either that the patient had or seemed likely to have, respiratory-muscle failure, or bulbar involvement, with or without respiratory embarrassment. The distribution of admissions throughout this period is shown in fig. 1.

Three types of case were admitted during this time.

(1) Acute anterior poliomyelitis (63) (90%).
(2) Acute toxic polyneuritis (5) (7%).
(3) Encephalomyelitis of unknown ætiology (2) (3%).

The methods of treatment used and the mortality-rates in each group are shown in the accompanying table.

The age-distribution in the 70 cases is shown in fig. 2. There was another patient, aged 76, not included in fig. 2, who was admitted during the acute stage of poliomyelitis with severe respiratory-muscle failure.

The sex-incidence was male : female = 1 : 1·1 (poliomyelitis only).

ASSESSMENT OF RESPIRATORY MUSCLE INSUFFICIENCY

Once the diagnosis of paresis of the breathing muscles had been made, a very close watch was kept for increase in weakness. It cannot be too strongly emphasised that the appearance of the patient with rapidly advancing weakness may be misleading. Cyanosis may not be observed or detected only with difficulty even when, for example, arterial oxygen saturation may be well below 90%. Mental alertness may seem unimpaired; indeed there is a tendency to sleeplessness and agitation. The signs that could be confidently expected in acute pneumonic conditions with only moderate lung changes were rarely a striking feature, even with considerable respiratory-muscle failure. This was particularly true of dyspnœa and cyanosis, which, unless there was lung congestion, collapse, or secretions in the airway, were seen only when the vital capacity had been reduced to a small fraction of the normal.

The association of respiratory-muscle paralysis, even slight or moderate paralysis, with an airway obstructed by accumulated secretions (the "wet" case) greatly increased the signs of ventilatory insufficiency. Where cyanosis and dyspnœa are great, and there are still reasonable or quite good breathing movements, lung changes and/or airway obstruction are almost certainly present.

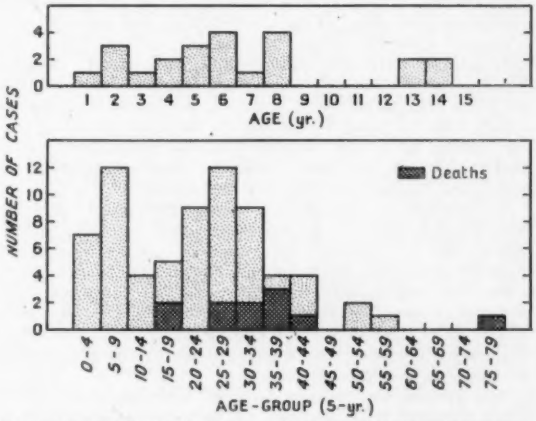

Fig. 2—Age-distribution in 70 cases of acute respiratory poliomyelitis.

As we have said a close watch must be kept on the ventilatory defect. In a few hours it may become gross, greatly increasing the risk of poor results of treatment applied too late. The condition deteriorates more rapidly in certain conditions—notably during labour. It is therefore important that where possible the patient

TYPES OF CASE TREATED AND ASSOCIATED MORTALITY-RATE

Diagnosis	Type	No. of cases	Method of artificial respiration			Mortality-rates			Total mortality-rates
			Cabinet	I.P.P.R.	No artificial respiration required	Cabinet	I.P.P.R.	No artificial respiration required	
A.P.M. (63 cases) (90%)	Spinal (respiratory)	39 (62%)	(c) 32 (82%)	3 (8%)	4 (10%)	1 (3%)	(c) 2 (67%)	—	3 (8%)
	Bulbar	2 (3%)	—	—	2 (100%)	—	—	(g) 1 (50%)	1 (50%)
	Bulbospinal	(a) 22 (35%)	(d) 8 (36%)	5 (23%)	9 (40%)	(h) 2 (25%)	(f) 3 (60%)	(i) 1 (11%)	6 (27%)
Toxic polyneuritis (5 cases) (7%)	Without bulbar paresis	3 (60%)	3 (100%)	—	—	—	—	—	—
	With bulbar paresis	2 (40%)	—	2 (100%)	—	—	—	—	—
Encephalomyelitis (2 cases) (3%)	Bulbospinal	(b) 2 (100%)	—	2 (100%)	—	—	1 (50%)	—	1 (50%)
		70 (100%)	43 (61%)	12 (17%)	15 (21%)	3 (7%)	6 (50%)	2 (13%)	11 (16%)

(a) No respiratory-muscle involvement 9%; with respiratory-muscle involvement 25%.
(b) Both cases had bulbar paralysis with respiratory-muscle involvement.
(c) 2 cases (6%) subjected to tracheotomy because of chest complications and subsequently treated in a cabinet respirator.
(d) 5 cases (62%) subjected to tracheotomy and treated in a cabinet respirator.
(e) Including a woman of 76.
(f) Including a patient who, after being weaned from artificial respiration, died of a pulmonary embolism.
(g) A man of 35 who died of myocarditis.
(h) Including a patient who had a tracheotomy and was then nursed in a cabinet respirator.
(i) Died of heart-failure.

should be in a centre where the staff is experienced in the recognition and treatment of respiratory failure. The experienced physician may be expected to gauge accurately when and how the complications shall be treated. Where the means are available, and when there is time, assessment may be aided by certain laboratory investigations. We found that one of the most useful, and at the same time most readily available, was the estimation of the venous plasma-CO_2-combining-power, in conjunction with calculations of the urinary pH.

Pulse-rate, temperature, and respiration-rate were charted at least every four hours. Of other recordings, the most helpful were of the vital capacity or tidal air and the blood-pressure. A rising blood-pressure usually means underventilation and carbon-dioxide retention. Spirometry, where it can accurately be used, is very desirable, but often in the acute stage, and especially in children, difficulty arose because of leakage, failure to secure the patient's coöperation, and other factors. In such cases, especially when mask leakage was suspected or when the patient was agitated, we found it easier to judge vital capacity by his ability to count aloud in one expiration after the deepest possible inspiration. Unfortunately all too often, even in adults, agitation or confusion, make even this test unreliable.

A careful examination of the breathing muscles was helpful, but the judgment of diaphragmatic movement may be masked—e.g., good epigastric movement may be seen even when half the diaphragm is immobile, since the unaffected half overacts in compensation. Whenever possible respiratory movements have been observed by fluoroscopy and helpful information obtained, although fluoroscopy is of greater use in the assessment of recovery in convalescence.

We judged the patient to need assistance when the vital capacity was reduced to between a third and a quarter of the expected normal. We feel this is better than allowing the patient to become anoxic or exhausted. We found that fear of the respirator could be altogether avoided by a gentle and unhurried introduction to the machine—first, on the stretcher only, used as a bed, and later with small pressures applied. The necessity to give some rest to his affected muscles was fully explained to the patient.

Too much reliance has hitherto been placed upon the patient's response to the respirator pressures and rates. Admittedly this has often proved quite satisfactory; but Radford et al. (1954), by their work on the use of a nomogram to estimate tidal air requirements of patients under varying conditions, have encouraged a more scientific approach to prescribed tidal air and minute volumes, and we have made use of this whenever possible. But experience has shown that the slightly overventilated patient comes to no harm whereas underventilation has serious disadvantages. It has therefore been our practice to exceed the tidal air, as estimated from the nomogram, by about 15%.

CHOICE OF ARTIFICIAL RESPIRATION

A patient may be affected in one of the following ways:

(1) Respiratory-muscle paralysis without lung damage.
(2) Respiratory-muscle paralysis with lung damage—e.g., congestion and/or collapse.
(3) Respiratory-muscle paralysis with lung damage and also with accumulation of mucus in the bronchial tree.
(4) A combination of (3) with swallowing difficulty.

We selected a method, or combination of methods, which, while not subjecting the patient to unnecessary trauma or risk, gave a reasonable chance of success and yet time for reassessment and for a smooth change-over to alternative techniques before graver damage was done.

For example, for group 1 there is no doubt in our minds that the standard cabinet (tank) respirator, adapted to give better access for nursing and physiotherapy, is an efficient machine. It has limitations such as cost, bulk, and some inaccessibility to the patient, but the latter in particular has been very successfully overcome in recent designs such as the "alligator" and "split-front" patterns. It can provide the prescribed tidal airs and minute volumes almost without limitation and does so without the selective and damaging effects on ventilation that the more restrictive designs of certain cuirass respirators can induce. There are signs that continental physicians, most of whom favoured cuirass respirators, are swinging away from them in favour of the cabinet type for patients in group 1.

In group 2 (respiratory-muscle paralysis with lung congestion and/or collapse), we still use the modern cabinet machine and avoid tracheotomy if possible. This may seem heretical in view of the practice in some American centres where an elective tracheotomy is often done in anticipation of these complications. Admittedly our selection involves dependence on ample man-power for the encouragement of lung drainage by frequent changes of posture, particularly prone positioning, and for very active chest physiotherapy; but it is often successful and it avoids the trauma of operation and the possible difficulties in detubation later. We were, however, guided by progress and did not delay in adopting alternative techniques—e.g., tracheotomy and tank, or I.P.P.R.

Where the combination of group 3 had developed, we found that the techniques for group 2 were still occasionally successful. But there was often an insidious deterioration or a rapid crisis with this combination of defects, and it seemed wiser to choose tracheotomy, using the silver cannula, with continued cabinet-respirator assistance (as is common in current methods in the U.S.A.), or to select a method of I.P.P.R., and the rubber cuffed tube, as in recent Scandinavian techniques. Our choice in the tracheotomy case has been guided to some extent by whether or not suitable apparatus was available, but also by the desire to give unprejudiced trial to both methods.

In group 4 we have no doubt that tracheotomy with a cuffed tube gives the best results, either with cabinet respirator or I.P.P.R.

PHARYNGEAL PARALYSIS WITHOUT RESPIRATORY-MUSCLE DEFECT

We have seen varying degrees of this class of "bulbar" poliomyelitis. With adequate medical and nursing supervision, postural drainage in the prone or semi-prone position inclined to an angle of 10° or 15°, preferably on a special postural-drainage bed, is the method of choice. There must be no attempt at oral feeding. Preparations for laryngeal intubation and tracheotomy must never be neglected, particularly if the patient is liable to vomiting or where a very close and skilled watch cannot be maintained. If vomit or mucus has already been aspirated, tracheotomy or bronchoscopy and suction offer the best chance of success.

Respiratory Complications

All patients admitted to the respiratory unit were regarded from the first as likely to develop lung complications if measures to prevent them were not undertaken without delay. The methods we used and the conclusions that can be drawn from our results may help others to assess the efficacy of those methods, and we therefore give below a more detailed account of the types of complications involving the respiratory tract and their treatment.

The respiratory complications in this series may be classified as follows:

(A) Obstruction of the air-passages above the carina.
(B) Infections of the lung.
(C) Collapse of the lung.

In group A the obstruction was caused by mucus, mucopus, or inhaled vomit. In group B the infections of the lung were either pneumonia or bronchitis. In group C it was found that collapse of the lung might occur as a result of :

(1) Secondary infection, which was met with in both the acute and recovery stages.

(2) The aspiration of pharyngeal mucus, saliva, or food, or regurgitated stomach contents.

(3) In the very early acute stage where an increase of bronchial secretions was associated with virus inflammation of the mucosa or with autonomic disturbances producing congestion, the defective coughing power, together with a few hours of poor lung drainage, appeared to precipitate a lung collapse.

There were 38 occasions when acute obstruction above the carina (group A) required emergency treatment by medical or physiotherapy staff; and there were also many occasions when less severe obstruction was dealt with by the nursing staff. There were 6 cases of lung infection (group B); and 14 instances of collapse of part of a lung (group C).

At the first sign of a complication, treatment was changed from the routine prophylactic to the curative. The nature of the prophylactic measures depended on the extent to which the disease had advanced at the time of admission; and they fell into the following categories :

(1) *Mild Respiratory-muscle Failure not Sufficient to Require Artificial Respiration*

Treatment was designed to enhance diminished coughing-power by lower thoracic compression during expiration. The patient lay in the prone or semi-prone position on a postural-drainage bed. This treatment was undertaken routinely two, three, or four times daily, and any mucus collecting in the upper air-passages was thus removed. When it was thought beneficial the patient was also given a period of assisted ventilation—say, one, two, or three hours daily—in a cabinet respirator to ensure adequate expansion of all parts of the lungs.

(2) *Chest-muscle Paralysis Requiring Artificial Respiration, but with no Bulbar Involvement*

Most of these patients had " dry " chests on admission to the respiratory unit. We felt that the adequate ventilation provided by the cabinet respirator, together with side-to-side turning, and sometimes short periods of deeper ventilation produced by increased cabinet pressures, would be sufficient to prevent the onset of lung complications.

(3) *Bulbar poliomyelitis with or without Spinal Paralysis*

There were 42 cases in the first two categories. Of the 38 in category 2, 14 (40%) had lung complications (6 had lung infections and 8 collapse). A further 11 patients had obstruction above the carina which was sufficiently severe to need emergency measures.

PROPHYLAXIS AND TREATMENT

Of the 4 cases in the acute stage of poliomyelitis with respiratory embarrassment so mild as to make assisted ventilation unnecessary, none developed respiratory complications.

Obstruction by Mucus of Air-passages above the Carina

This was seen either when the patient arrived at the hospital, or during treatment in the cabinet respirator, or in the recovery period following weaning from artificial respiration. When obstruction was present on admission, respiratory embarrassment was considerable. There were audible bubbling sounds in the air-passages which could be even better heard by auscultation over the open mouth. The patient was at once turned into the prone position, the buttocks higher than the head, and compression of the lower ribs during expiration was combined with percussion and encouragement to cough. It should be emphasised that in these cases there was no bulbar involvement, and the condition had arisen because of the poor respiratory musculature and a failure to cough effectively in a patient whose mucus secretion was already above normal. The improvement obtained by this method of drainage was often so great that it became feasible to make a more leisurely examination of the patient and therefore to make a more accurate assessment of the respiratory musculature.

If the picture was complicated by severe respiratory-muscle paralysis, or if the obstruction occurred when the patient was already being nursed in a cabinet respirator, then the drainage of mucus was combined with mechanical artificial respiration. The principle of the treatment was to ventilate the patient in the cabinet respirator while in the prone position. When the patient was already in the cabinet, it was at once opened and the patient pronated by a team of four nurses, one to adjust the head-rest and collar and to guard the head, the others to turn the patient. The whole manœuvre could be completed in about a minute with little discomfort. The respirator was then closed and its head tilted down to an angle of about 15°. The proximal cuff-sealed portholes on each side were opened and bilateral compression of the lower chest given by two physiotherapists who synchronised their compression with the expiratory phase as indicated by the manometer on the top of the cabinet. The patient could be left in the prone position with little discomfort for between half and one hour.

Sometimes it was impossible to resort to prone-position drainage, either because the type of respirator in use was unsuitable, or because the condition of the patient did not allow satisfactory ventilation while the manœuvre was being completed. Chest compression was then performed, less efficiently it is true, with the patient in the supine position while the mucus was removed from the pharynx with a sucker.

Finally, the obstruction was occasionally so severe and the mucus so tenacious, that the only method of establishing an airway proved to be tracheal intubation followed by tracheotomy.

Lung Infections

To distinguish between early pneumonia and excess of mucus in the upper air-passages was often difficult when respiratory-muscle failure was being treated in a cabinet respirator. The classical findings of an early pneumonia, such as crepitations and bronchial breathing, are often slight, because of the grossly impaired respiratory excursion, so that the general condition, pulse-rate, colour, leucocytosis, increasing accessory-muscle movement, and impaired percussion are more helpful. When considerable areas of collapse are suspected, the diagnosis may be assisted by auscultation while lung inflation is carried out by I.P.P.R.

When a lung infection was diagnosed, the procedure was as follows :

Physiotherapy.—If there was much mucopus, the patient was turned into the prone position in the cabinet respirator (as already described), and this was repeated three, four, or six hourly.

Antibiotics.—Most of the antibiotics were tried at various times. A combination of penicillin and streptomycin seemed best.

Lung Collapse

8 patients had lung collapse, and 4 of them had evidence of it on admission or within twenty-four hours. We feel that the likelihood of collapse increased considerably the longer the delay from the first sign of respiratory-muscle failure to the start of assisted ventilation and/or physiotherapy. Treatment was initially the same as for mucus obstruction—i.e., prone-position drainage and vigorous physiotherapy, to which was added steam humidification. Most patients responded satisfactorily. If these measures failed, bronchoscopy was performed. It was possible to do this in the cabinet respirator so that assisted ventilation could be given at the same time. The instruments for tracheotomy were always kept ready, because mucus production may be so increased by trauma to the mucosa that tracheotomy is needed to relieve obstruction.

In 3 cases lung collapse was so severe that tracheotomy was required to allow of greater ease of aspiration and physiotherapy. 1 of these patients was then nursed entirely in the cabinet respirator and eventually made a complete recovery. The other two were ventilated by I.P.P.R. Of these one had such gross bilateral collapse that, despite every effort, she died, while the other recovered satisfactorily.

Bulbar Poliomyelitis with or without Spinal Paralysis

Prophylactic measures in cases of bulbar poliomyelitis without respiratory-muscle paralysis were designed to prevent the aspiration of food or saliva into the trachea. The patients were nursed on a postural-drainage bed in the semi-prone position. Postural drainage, percussion, and compression of the lower chest were applied routinely four or six hourly. The patient was fed by nasal tube. There were 11 patients in this group, of whom 8 had no complications and made excellent recoveries. 2 died, apparently of heart-failure in the acute stage. At necropsy there were no signs of lung complications.

A patient suddenly had obstruction of the left bronchus on the fifth day; to relieve this it was necessary to pass an endotracheal tube and eventually to perform a tracheotomy. He then did well until the twenty-fifth when he suddenly died of a pulmonary embolism from a thrombosed femoral vein. It is interesting that this catastrophe occurred despite side-to-side turning and passive movements to the limbs, in which there was no paralysis.

In 17 cases there was both paralysis of swallowing and moderate or severe respiratory-muscle failure. 14 required tracheotomy; and 5 of these patients were nursed largely in a cabinet respirator. The other 9 were ventilated by mechanically operated I.P.P. pumps. Of the 3 patients not subjected to tracheotomy, 1 died shortly after the onset of bulbar paresis and before further measures could be undertaken; 1 died of heart-failure before artificial respiration was started, and the third was nursed in a cabinet respirator with frequent postural drainage and made a satisfactory recovery. All patients with a tracheotomy, whether treated in a cabinet respirator or with I.P.P.R., were given basically similar chest physiotherapy. Routine two-hourly turning from side to side in the acute stage gradually became less frequent as recovery progressed. Percussion and lower-chest compression to encourage coughing were given every few hours.

Lowering Viscosity of Secretions

As an adjunct to physiotherapy, and for the patient's comfort, some form of humidification was always combined with tracheotomy. The following methods were tried:

(1) All patients treated with I.P.P.R. had a thermostatically controlled humidifier included in the circuit. The water-temperature was stabilised at between 90° and 110°F, and the humidification was continuous. Humidification in this type of case seemed essential in the acute stages both to prevent the onset of a tracheitis and to lower the viscosity of the secretions. But one patient has now been on I.P.P.R. without humidification for nine months, and there have been no adverse effects.

(2) For patients nursed in a cabinet respirator with a tracheotomy a steam tent was erected over the head of the respirator. This method was satisfactory as a prophylactic measure but had little or no effect on the mucus once the viscosity had become higher than normal.

(3) 'Alevaire' (a detergent aerosol) was given to 4 patients in the cabinet respirator. The atomised alevaire was projected through the side arm of a Cobb's union inserted into the top of the rubber tracheotomy tube. The mist was thus sucked into the respiratory passages during inspiration. We found the best results were obtained by allowing it to flow for about half an hour every two or three hours. In all 4 cases it appeared to have some effect in lowering the secretion viscosity, but in one other case in which it was delivered through a close-fitting face mask instead of a tracheotomy tube, it was unsuccessful in preventing the need for two bronchoscopies. It has the slight disadvantage that it is liable to produce a mild blepharitis and conjunctivitis, but this can be overcome by covering the eyes while it is being applied.

The administration of alevaire appeared to produce some lowering of secretion viscosity as judged by inspection of the mucus. Nevertheless it must be said that of the 5 cases of bulbospinal poliomyelitis treated in cabinet respirators after tracheotomy, 4 had complete or partial left-lung collapse which was sufficient to require bronchoscopy. In only 1 of 9 cases on I.P.P.R. was there lung collapse; in 6 the sputum became mucopurulent at some stage though there was no clinical or radiological evidence of pneumonia. This infection may have been a local one in the trachea and main bronchi after the intubation and tracheotomy. Though the numbers are small, it seems possible that the differing incidence of lung collapse in patients treated with I.P.P.R. and those nursed in cabinet respirators after tracheotomy may be accounted for by the increased mobility and accessibility of the I.P.P.R. patient.

Withdrawal of Artificial Respiration

The increasing survival-rate in severe respiratory poliomyelitis has brought to the fore the question of successful "weaning" from artificial respiration. Particularly prominent during the past two years has been the difficulty in weaning the bulbospinal case from his tracheotomy.

Cabinet Respirators

During the acute stages in a severely ill patient, no attempt was made to encourage spontaneous breathing, apart from that required for clinical evaluation. As soon as the patient was apyrexial and free from discomfort, unobtrusive weaning began. During nursing attention the patient was allowed to breathe without assistance instead of with the intermittent positive-pressure mask, care being taken to avoid exhaustion and panic. The period of unassisted breathing and the patient's reaction to it were charted, and from then, depending on the degree of respiratory-muscle paralysis, a programme of weaning was devised.

Unassisted respiration was limited at first to a short period—say, quarter of an hour daily—apart from the usual times at which nursing attention was given. A careful watch was kept on the patient's reactions and he was returned to the respirator at the first signs of distress. As the time of unassisted breathing extended, a regular check was kept on the pulse, respiration-rate, and blood-pressure, while alkali-reserve levels were found to be of some use when a period of hours was reached.

The importance of these recordings was emphasised in one chronic respiratory case sent to us for investigation after great difficulty in weaning, although the respiratory effort appeared adequate to support her for several hours a day. At the time of admission, six years after the attack of poliomyelitis, she could breathe without assistance for only ten minutes. Investigation of the alkali reserve showed changes consistent with prolonged hyperventilation in a cabinet respirator. Opening of the respirator resulted in the patient attempting to maintain her state of hyperventilation by shallow and rapid respiratory efforts and she required to be returned to it in a few minutes. It appeared that a state of "chronic" hyperventilation had been the "normal" for this particular patient; any attempt at altering it, such as unassisted respiration, resulted in dyspnœa, headache, and vertigo. By carefully controlled weaning, largely through a gradual reduction of respirator pressures and rates, and later transfer to a rocking-bed, she was eventually able to do without assisted ventilation during the day and to carry on a reasonably normal ambulant life. (This case is not one of the 70 in this series.)

The cuirass respirator has been proved by years of experience to be a useful adjunct to weaning, or indeed to replace other forms of respirator when the patient needs assistance for some part of the day, even maybe indefinitely. Our experience fully supports the general approval of this apparatus for the late stages of respirator therapy. In common with the rocking-bed it has little, if any, place in the acute stage.

Intermittent Positive-pressure Respiration with Tracheostomy

No attempt was made to close the tracheostomy opening until two essential criteria had been fulfilled :

(*a*) The patient was able to swallow normally.

(*b*) The patient was able to cough sufficiently well to expel mucus from the larynx, even if at first this coughing needed assistance by lower thoracic compression and postural drainage.

Usually the power of swallowing had returned within twenty-eight days. In 3 cases the return was very much delayed—six, nine, and twelve weeks respectively. An attempt was made to encourage the return in these cases by :

(1) Discontinuing the use of the sucker upon which these patients had become dependent for removing secretions from their mouths.

(2) Sitting the patient upright as far as the muscular condition allowed, to assist the effects of gravity in the pharynx.

(3) Providing chewing-gum to promote the flow of saliva and increase the use of the muscles of chewing.

In all the surviving bulbospinal cases the power of swallowing eventually returned apparently completely.

When the acute stage of the disease had passed patients with I.P.P.R. were disconnected from their circuit for an increasing time daily until they were able to be transferred to the rocking-beds. If necessary I.P.P.R. was synchronised to the rocking action as is now possible in one type of bed commercially available in this country.

In time the criteria of satisfactory coughing and swallowing would be fulfilled and at that stage the rubber tracheotomy tube was removed. This was always done in two stages. The largest convenient size of fenestrated silver tube was inserted to replace the cuffed rubber tracheotomy tube. The presence of the fenestrum accustomed the patient to the passage of air over the vocal cords and allowed him to learn to cough again, knowing all the time that should obstruction occur, the mucus could be removed by suction. After a few days a cork was placed in the opening of the silver tube so that the normal pharyngotracheal airway was re-established ; but still any obstruction could be cleared by suction. When the doctors and the patient were certain that there was no longer any danger of obstinate mucus collection, the silver tube was removed, and the tracheostomy opening allowed to heal.

In no case in this series was any lasting difficulty experienced in the removal of the tracheotomy tube so long as this régime was followed. In two cases the rubber tube was removed without replacement by a silver one, and in both the patients became severely obstructed in a few hours, and, despite active physiotherapy, the rubber tube had to be replaced.

There were 70 patients in this series, of whom 59 survived. Of these 46 (77%) required artificial respiration for longer than forty-eight hours. 1 patient (2%) still requires it and is likely to do so permanently.

Discussion

The impact of the Scandinavian work, notably that of Lassen and his colleagues in Copenhagen, has widened the scope of methods used for the relief of the complications of poliomyelitis with respiratory defects. In the U.S.A. there has been only tardy acceptance of the advantages claimed for tracheotomy and I.P.P.R., but Mörch et al. (1956) have recently drawn attention to its use in that country. By far the most widely used method in the U.S.A. has been tank (cabinet) respiration, with or without tracheotomy according to circumstances ; and statistical analysis shows results which are at least as good as those achieved by any other method. Scandinavian work has shown a preference for tracheotomy and I.P.P.R. but to some extent, especially in Sweden, comparisons with American practice have been either impossible or numerically few because of the absence or paucity of cabinet respirators or of adequate trials of the treatment of tracheotomy cases in these machines. In Britain, cabinet respirators have been most used, and experience of these has shown their limitations but also that they have a very real value. Cuirass respirators are efficient only in convalescence or for assisted respiration in the partly paralysed chronic patient. They also have a place in the transport of patients by air or ambulance. The rocking-bed had been tried in many of our cases and we are convinced that it is of value in diaphragmatic paresis and that it can replace the cabinet or the cuirass when the patient has reached a stage where he is independent of the cabinet for several hours daily.

In 1955 our unit had cabinet and intermittent positive-pressure respirators of modern design. Before this study no definite decision had been taken as to which method would be used, and it became our practice to decide only after careful clinical assessment of a particular case. Previous experience had shown that the patient with respiratory paralysis, without bulbar involvement or serious lung complications, responded well to artificial respiration in the cabinet respirator and we followed this practice in all patients in this category (32 cases) (see table). Our methods of prophylactic chest physiotherapy have been outlined, and it will also have been observed that there was a relatively high incidence of lung complications. Experience may show that still more intensive physiotherapy is required in the form of routine prone position, chest percussion, and compression. The excellent results after this method of treatment here may still further underline its importance whenever there is suspicion of a lung infection and/or collapse.

We believe there is a place for tracheotomy in some patients with respiratory-muscle paralysis without bulbar involvement when infection or collapse has occurred. If prone position, percussion, and compression, followed by bronchoscopy, fail to produce adequate ventilation, or there is a lack of suitably skilled attendants to carry out these procedures, then the preference is for tracheotomy and I.P.P.R., providing better access to the lungs for aspiration, greater mobility of the patient, and more efficient humidification.

There is reason to believe that incorrect application of I.P.P.R. may damage the cardiovascular system ; but we feel that the risk is remote when there is an unimpaired circulation and that the very considerable advantages of the method—accessibility for nursing and treatment—outweigh other defects. The nursing of the tracheotomy patient in a cabinet is practicable where, change of posture and accessibility is easily achieved, as in children, and the system often has obvious advantages. There is, therefore, in our view, a place for both systems, and the choice is one which experience and necessity dictates.

Early treatment for respiratory failure is very desirable, and we are convinced that if adequate provision for poor breathing effort is given before the vital capacity has dropped to between a fifth or a quarter of the expected normal, many of the complications which call for more drastic measures would be avoided. This means that patients must be admitted to special units as early as practicable. When there is evidence of inadequate ventilation, or there is reason to suspect that retained secretions are the cause of it, and chest physiotherapy such as we have described, does not properly relieve it, there should be no hesitation in adopting tracheotomy followed by appropriate artificial ventilation.

Summary

70 cases of poliomyelitis and other conditions with respiratory-muscle failure and/or bulbar paralysis were admitted to a special unit between December, 1954, and January, 1956. This series was analysed to illustrate the

management of the early case, and the method of assessing the degree of respiratory insufficiency and the need for artificial respiration.

Patients with respiratory paralysis, without bulbar involvement or serious lung complications, did well in the cabinet respirator. There is a place for tracheotomy in some patients with respiratory paralysis without bulbar involvement when infection or collapse has developed. The advantages of intermittent positive-pressure respiration are often great, and there is a place for both methods.

Lung complications were relatively common and it may be that even more intensive preventive physiotherapy is needed.

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Preliminary Communication

APPARENT PLEIOTROPIC EFFECT OF GENES DETERMINING TASTE THRESHOLDS FOR PHENYLTHIOUREA

TASTE dimorphism in sensitivity to phenylthiourea has been shown to be genetic, depending on a main pair of genes.[1 2] The populational distribution of individual taste thresholds is bimodal [3–5] and the anti-mode is used as a criterion for discriminating between tasters and non-tasters. A considerable part of the subjectivity in classifying these phenotypes has been eliminated by using a technique improved by a sorting test.[6] The genetic behaviour of the character suggests that there are modifying factors for penetrance or dominance. There is probably a difference in the frequencies of tasters and non-tasters in males and females, as suggested by the results obtained by using a sorting technique.[7]

TABLE I—DISTRIBUTION OF TASTE THRESHOLDS OF 496 TUBERCULOUS PATIENTS OF EITHER SEX

—	Taste thresholds														Total	Non-tasters
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Males	8	13	11	5	2	9	15	24	46	64	46	29	11	4	2	289	39 (*13·49%*)
Females	8	13	4	3	3	1	2	13	26	42	51	22	15	4	0	207	31 (*14·98%*)
Total	16	26	15	8	5	10	17	37	72	106	97	51	26	8	2	496	70 (*14·11%*)

The concentrations of the different fourteen solutions of phenylthiourea were the same as those used by Harris and Kalmus.[6] The male patients were aged 17–65 and the female 15–63.

Substances containing the chemical group CNS, of which phenylthiourea is most characteristic,[8] seem usually to be tasted by 30% of white people. A large number of these chemicals have a goitrogenic effect,[9] but no clear significant difference in frequency of non-tasters was found among patients with disease of the thyroid gland compared with the general population.[10] Similarly the difference found between diabetics and the general population [11] was not confirmed.[10]

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7. Saldanha, P. H., Guinsburg, S. *Rev. bras. Biol.* 1954, **14**, 285.
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10. Harris, H., Kalmus, H., Trotter, W. R. *Lancet*, 1949, ii, 1038.
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TABLE II—COMPARISON OF PROPORTIONS OF NON-TASTERS OBSERVED BETWEEN HEALTHY CONTROLS AND TUBERCULOUS PATIENTS OF SAME AGE-RANGE AND BETWEEN TUBERCULOUS PATIENTS, TUBERCULOUS CHILDREN, AND NON-TUBERCULOUS CHILDREN OF TUBERCULOUS PATIENTS

Sample	Age-range (yr.)	Total	Non-tasters	
Normal subjects [7] ..	17–32	164	50 (*30·5%*)	$\chi^2 = 17·4$
Tuberculous people ..	15–32	294	42 (*14·3%*)	$P < 0·01$
	15–65	496	70 (*14·1%*)	
Tuberculous children	3–15	106	66	$\chi^2 = 19·2$
Non-tuberculous children of tuberculous parents		255	28 (*26·0%*)	$P < 0·01$

The results of many investigations suggest the relationship between blood-group and susceptibility to disease.[12] In an investigation of the relationship of blood-groups and susceptibility to tuberculosis [13] we found a low number of non-tasters of phenylthiourea among white tuberculous people. The fact that genetical factors are involved in the susceptibility to tuberculosis [14–16] suggests that the susceptibility to tuberculosis and the ability to taste phenylthiourea may depend on the same genes. We therefore made more extensive investigations to confirm whether our incidental observation was true or not.

We studied 496 tuberculous adults, 106 tuberculous children, and 255 non-tuberculous children who had tuberculous parents and had been reared apart from them for protection against tuberculosis. 164 healthy people presenting the same racial characteristics were used as controls. The tuberculous and the healthy controls were classified by the sorting technique,[6] but only five critical solutions of phenylthiourea were used in discriminating non-taster children. The distribution of taste thresholds for the tuberculous is shown in table I. A highly significant difference in the proportion of non-tasters was found among the tuberculous and the healthy in the same age-group (table II).

A similar difference was observed between the tuberculous and the children of tuberculous parents (table II). These differences could depend on a lower taste sensitivity of the tuberculous but instead they usually showed significantly higher thresholds for phenylthiourea than did the healthy controls (table III). These facts could be explained on the hypothesis of a differential juvenile mortality between taster and non-taster tuberculous phenotypes, causing a decrease of lower thresholds in tuberculous populations.

TABLE III—COMPARISON OF TASTE THRESHOLDS OF HEALTHY CONTROLS AND OF TUBERCULOUS PATIENTS OF SAME AGE-RANGE

Sex	Sample	Age-range (yr.)	No. of people	Mean and S.D.	t	P
M	Healthy controls	19–32	66	5·67 ±4·13	4·88	$P < 0·01$
	Tuberculous patients .	17–32	165	8·09 ±3·02		
F	Healthy controls	17–30	98	7·78 ±3·85	1·92	$P \simeq 0·05$
	Tuberculous patients ..	15–30	129	8·31 ±3·27		

It is possible that the non-taster genotype has a greater susceptibility not only to tuberculosis but also to infectious diseases in general, but this has not yet been discovered.

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Reviews of Books

Peripheral Vascular Disorders

Editors: PETER MARTIN, V.R.D., M.CHIR., lecturer in surgery, Postgraduate Medical School, London; R. BEVERLEY LYNN, M.D., F.R.C.S., assistant professor of surgery, Medical College, University of Saskatchewan; J. HENRY DIBLE, LL.D., F.R.C.P., professor emeritus of pathology in the University of London at the school; IAN AIRD, CH.M., F.R.C.S., professor of surgery in the University of London at the school. Edinburgh and London: E. & S. Livingstone. 1956. Pp. 847. £5 10*s*.

THE clinician who deals with peripheral vascular diseases needs to know a good deal of anatomy, physiology, pathology, and radiology as applied to the limb vessels—a fact clearly recognised in this new British volume, over a third of which is devoted to the para-clinical subjects. The chapters by Prof. Henry Barcroft on the physiological control of blood-flow and Professor Dible on the pathology of atherosclerosis are particularly readable and informative. The remainder of the book is devoted to the clinical aspects of vascular disorders and reflects the experience of the authors and their colleagues at the Postgraduate Medical School of London. Syndromes still in dispute, such as "primary popliteal thrombosis" are discussed with a fine sense of balance, and dogmatism has largely been avoided.

This book will be a good companion for clinicians who are occasionally called on to treat patients with vascular disorders, and certainly it will be widely used by candidates for higher examinations.

Histopathologie du foie

Le diagnostic des affections hépatiques: étude iconographique. P. CAZAL, professeur à la faculté de médecine de Montpellier. Paris: Masson. 1955. Pp. 207. Fr. 4000.

THE increasing use of aspiration biopsy in the study and diagnosis of hepatic disorders has emphasised the lack of an adequate atlas of these conditions. The author, on the basis of 4000 such biopsies, has set out to repair this deficiency.

He has not confined himself to what are usually regarded as hepatic diseases but has produced magnificent illustrations of a great variety of lesions that affect the liver, often without causing symptoms, in the course of other diseases. The photomicrography is excellent, and the reproduction on paper of the highest quality is a joy both to eye and to hand. A feature of great value is the frequent inclusion of small sketches alongside the main figures, to pinpoint the distribution of the features illustrated. There are a total of 210 photomicrographs in black and white, each of half-plate size, and 24 small reproductions in colour.

No atlas can take the place of experience in recognising histopathological states, but this one is much more than a mere diagnostic aid: because of the great detail of many of the pictures it is a real contribution to hepatic pathology.

Vitamins and Hormones

Vol. XIII. *Advances in Research and Applications.* Editors: ROBERT S. HARRIS, professor of biochemistry of nutrition, Massachusetts Institute of Technology; G. F. MARRIAN, professor of medical chemistry, University of Edinburgh; KENNETH V. THIMANN, professor of plant physiology, Harvard University. New York: Academic Press. London: Academic Books. 1955. Pp. 382. 72*s*.

READERS familiar with this publication will find no major changes in its form, although there is perhaps slightly more emphasis on vitamins in this volume and less on hormones than in its immediate predecessor. The authors continue to represent a fair cross-section of international talent.

There are two articles on vitamin B_{12}—one by J. E. Ford and S. H. Hutner on its rôle in the metabolism of micro-organisms, and one by C. C. Ungley on its chemotherapeutic action. These should be read in connection with an article on vitamin B_{12} in the preceding volume. There is also a more general paper on the vitamin requirements of man by Lionel B. Pett, and one on their rôle in antibody production by A. E. Axelrod and J. Pruzansky. L. W. Mapson has dealt with the biosynthesis of ascorbic acid. The essential fatty acids are discussed by Harry Deuel and Raymond Reiser, and the relationships between parasitic infections and nutritional status by Dean A. Smith. William S. Bullough and Oscar Hechter contribute the two articles on hormones—the first on their effect on mitosis, the second on the mechanism of their action.

Students and lecturers will find much to interest them in all these articles. Those whose primary concern is clinical medicine or nutrition may be recommended to begin with the article on the essential fatty acids (their possible rôle in atherosclerosis is fascinating) or the one on parasites (why does the milk diet protect against malaria?). Those specially interested in the megaloblastic anæmias may turn without fear of disappointment to Ungley's article, and all administrators and others in high places would do well to read the whole of the article on vitamin requirements before calling for precise statements on such matters from committees set up to do their bidding. It is sad that the publishers of this volume should have had to increase the price—but it is worth it.

The Pregnancy Toxæmias or the Encymonic Atelositeses

G. W. THEOBALD, M.D., F.R.C.O.G., honorary obstetrician and gynæcologist, Royal Infirmary Bradford. London: Henry Kimpton. 1955. Pp. 488. 63*s*.

PERHAPS the most interesting and important chapters in this unusual book are the four headed the Nutritional-Mechanical Hypothesis; for they reflect Mr. Theobald's belief in what he calls the "dietetic deficiency-mechanical hypothesis." Since 1930 he has held that "all the ailments and 'toxæmias' associated with pregnancy are caused by an absolute insufficiency of some substance or some substances in the diet, the most important of which is calcium, which leads to an inharmonious working of the body and ultimately to hepatic dysfunction." He adduces evidence from many quarters in support of his view, but very fairly also lists the criticisms that have been advanced.

Though mostly well written, the book is not everywhere easy to understand: moreover Mr. Theobald is not content with such words as there are in our language, but must needs coin two new ones for his title. At the same time it clearly reflects hard work, wide experience, and scholarship. Those who study it carefully will find much that is novel and arresting, and much of general interest; they will find the author's survey wide, both in time and space—for example, the section on Politics in Nutrition ranges from the times of King Henry VIII and Queen Elizabeth I to those of Queen Victoria and Queen Elizabeth II, and from the shores of Siam to those of the Pacific Island of Naura.

Interpersonal Theory of Psychiatry

Editors: HELEN SWICK PERRY and MARY LADD GAWEL. Pp. 393. 35*s*.

Conceptions of Modern Psychiatry

HARRY STACK SULLIVAN, M.D. 2nd ed. Pp. 298. 32*s*. 6*d*.

The Psychiatric Interview

HARRY STACK SULLIVAN, M.D. Editors: HELEN SWICK PERRY and MARY LADD GAWEL. Pp. 246. 28*s*.

London: Tavistock Publications. 1955.

Sullivan's theories were influenced by many disciplines including psychiatry, psycho-analysis, sociology, anthropology, and linguistics. He viewed the human individual not as an isolated entity but as enmeshed in interpersonal forces which determine his adjustment to the other persons with whom he has to do. The "dynamism" of the individual and that of the other persons interreact in various ways. Anxiety is the principal disruptive force, hindering communication between individuals and transforming their "dynamism" into undesirable forms of thought or behaviour. Sullivan's concepts were defined by himself, and it is necessary to understand the terms he coined in order to understand his theories. His works have now been reproduced in this country.

The Interpersonal Theory of Psychiatry opens with three chapters describing the developmental approach that Sullivan favoured, and his definitions and postulates. The second and largest section of the book describes the developmental epochs from infancy to late adolescence in terms of these concepts.

The third section, on patterns of inadequate or inappropriate interpersonal relations, deals with earlier manifestations of mental disorder (schizoid and schizophrenic); sleep, dreams, and myths; and later manifestations of mental disorder (paranoid and paranoiac). The concluding section, "Towards a Psychiatry of Peoples," is concerned with psychiatry's possible contribution to international understanding.

Conceptions of Modern Psychiatry consists of the five William Alanson White lectures which Sullivan delivered in 1939, together with a critique of Sullivan's theories by Patrick Mullahy. The lectures are on basic conceptions, the human organism and its necessary environment, developmental syndromes, explanatory conceptions, and therapeutic conceptions.

The Psychiatric Interview is an extended application of Sullivan's interpersonal theories to the process of interviewing.

All three books suffer from prolixity, but this may be largely due to their being edited by disciples who were loth to prune or compress passages that may have made more impact when delivered in a lecture. Many revealing clinical descriptions lighten the material, and Sullivan's undoubted gifts for understanding the delicate interpenetrations of human personalities reward the reader's perseverance.

The Alkaloids: Chemistry and Physiology

Vol. v. *Pharmacology.* Editor: R. H. F. MANSKE, Dominion Rubber Research Laboratory, Guelph, Ontario. New York: Academic Press. London: Academic Books. 1955. Pp. 388. 76*s.*

THIS, the fifth and final volume of the series, covers all the alkaloids of medical interest, which are classified according to physiological rather than chemical or botanical affinities.

The contributors are recognised authorities, mainly from the United States and Canada; but the chapter on respiratory stimulants is written by M. J Dallemagne and C. Heymans of Ghent, while H. R. Ing of Oxford contributes an admirable account of mydriatics. Each chapter contains an historical introduction, an account of experimental and clinical methods used in assaying the activity discussed (the chapter on analgesics by H. Krueger is particularly valuable), an account of structure-action relationships, and a full discussion of the pharmacological activity of the various compounds. Pharmacologists will find that each chapter provides an informative and critical review of its field, with a discriminating bibliography—though unfortunately there are few references more recent than 1952.

This volume should appeal to all physicians interested in the scientific background of the alkaloids they handle in daily clinical practice.

Practical Neurology

LEO M. DAVIDOFF, M.D., professor of surgery, Albert Einstein College of Medicine, New York; EMANUEL H. FEIRING, M.D., associate professor of surgery (neurosurgery) at the college. New York: Landsberger Medical Books. London: McGraw-Hill. 1955. Pp. 442. 52*s.* 6*d.*

THIS is one of a series of handbooks for general practitioners. The general practitioner probably wants to know the early and commonest manifestation of serious neurological disease, and how far these may be simulated by trivial illness; the treatment of the complaint (in some detail if this is to be undertaken by him, otherwise only sufficiently to explain to the patient's relatives what is happening and to ensure that the patient gets the best available); and particularly the prognosis and how this is affected by treatment. If so, this book does not consistently succeed in its intention.

In an early chapter on the examination of the nervous system the outline is so simple at times as to be appropriate for a first-year medical student, while on the other hand spinal myelography is mentioned. This tendency to be both too elementary and too specialised is evident elsewhere. The chapter on tumours of the nervous system is the best; and the section on epilepsy deals well with practical problems.

Some of the defects may be due to the different relationship between general practice and specialist medicine in the United States; and some are probably due to the fact that the authors are neurosurgeons rather than neurologists. At any rate the book does not seem to be specially suited to the needs of the general practitioner over here.

Immunology and Serology

PHILIP L. CARPENTER, professor of bacteriology, University of Rhode Island. Philadelphia and London: W. B. Saunders. 1956. Pp. 351. 45*s.* 6*d.*

THIS book, in which "greater emphasis is placed upon serology than upon immunology," is intended for those "at the advanced undergraduate or early graduate level." The style is clear and the whole shows evidence of careful thought and preparation. It is surprising to find, however, that Topley's *Outline of Immunity*, published twenty-three years ago, stands up well to comparison. There is more recent detail in the present book, but the student is likely to obtain a clearer picture from the older volume.

Sir John Bland-Sutton, 1855–1936

W. R. BETT, M.R.C.S. Edinburgh: E. & S. Livingstone. 1956. Pp. 100. 20*s.*

A BRILLIANT and progressive surgeon; an unusually good lecturer who loved to choose intriguing titles for his addresses; a polished writer; a great benefactor of the Middlesex Hospital; president of the Royal College of Surgeons; at one time famous in the world of dentistry; a keen zoologist who realised the advantages to be derived from the systematic examination of animals dying in the London Zoo; a man with a host of friends in all walks of life; a Londoner of Londoners; the son of a market gardener—Bland-Sutton led a most interesting life. Small in build and short in stature with tiny hands and feet, clean-shaven with a firm mouth and, even in advanced life, jet-black hair, Sir John looked like Napoleon and liked to act the part.

Dr. Bett has made the most of his fascinating subject. The biography is enriched by quotations from Bland-Sutton's writings and by colourful stories. Emphasis is properly laid on his skill as a gynæcologist and his pioneer work on hysterectomy and the removal of fibroids; but little is said about his work as a general surgeon until late in the book. Some readers may find that the detailed bibliographical references are an interruption to their enjoyment of the text. But these are small matters.

Christopher's Textbook of Surgery (6th ed. Philadelphia & London: W. B. Saunders. 1956. Pp. 1480. £5 8*s.* 6*d.*).—From the pages of "Christopher," edited by Dr. Loyal Davis, surgery emerges as a rapidly expanding subject in which, accidentally or symptomatically, primary aldosteronism claims as much space as the management of club-foot or of hammer-toe. This is not a storehouse of experience accumulated by generations of practising surgeons, which in his textbooks the British undergraduate is enjoined to preserve, to cherish—but not to question. Instead we get an admirable chapter on surgical history and hardly a paragraph on historical surgery. As a source of reference this book would fail any candidate at Queen Square; but young surgeons with no immediate prospect of an examination (if they exist) and surgical teachers should not miss this fascinating glimpse of transatlantic surgery. More than fifty authors, all eminent, have tackled their subjects in an individual manner. This gives the book an air of honesty and first-hand authority; but it also results in confident dogmatism where perhaps a measure of intelligent ignorance would be more appropriate. This whole book is best regarded as a collection of essays, written not so much to give a balanced picture of a practical craft as to illustrate the application of fundamental scientific principles. Whether or not the book will help the many to become sound practitioners of surgery, it cannot fail to inspire the few to become its pioneers.

A Short Practice of Surgery (10th ed. London: H. K. Lewis. 1956. Pp. 1126. £4 4*s.*).—This work by Mr. Hamilton Bailey and Mr. R. J. McNeill Love is an old and valued students' friend: dogmatic, concise, profusely illustrated, and immensely helpful for examinations. Through successive editions it has grown in stature but also, alarmingly, in girth. Mr. John Charnley, Mr. W. P. Cleland, and Mr. Geoffrey Knight have rewritten with great skill the chapters on orthopædics, thoracic surgery, and neurosurgery; but future additions to the text might suitably be offset by ruthless pruning of much that is rapidly becoming dead wood even at Queen Square.

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THE LANCET
LONDON: SATURDAY, JULY 14, 1956

Bone and Joint Tuberculosis

THE place of chemotherapy in the treatment of tuberculosis of bones and joints is slowly being defined. Clearly it has its limitations and in some ways it has proved a disappointment. It is by no means a panacea and has not removed the need for general treatment, though this can often be shortened. Its usefulness has been most evident in three directions. Firstly, it has revolutionised the treatment of early joint tuberculosis: the prognosis of a joint detected at the purely synovial stage of infection is now excellent, and recovery with normal joint movement can usually be expected. HARWOOD STEVENSON [1] has shown that in the knee excellent results can be achieved with general chemotherapy and intra-articular streptomycin, even without strict immobilisation of the joint. Secondly, chemotherapy has reopened the way to early surgical attack on established disease—a method previously carrying grave risk of disaster from local and general dissemination. In such cases chemotherapy alone is of little avail because the diminished or absent blood-supply to the caseating centres of intra-osseous lesions prevents the drugs getting there in sufficient concentration; but it may limit the spread of the disease. MACKENZIE [2] has suggested that in these lesions there is a danger of promoting drug resistance by attacking the organism with inadequate concentrations of drugs. With the aid of streptomycin, however, these areas can now be safely cleared of necrotic debris and sequestra, and the way laid open for a fresh blood-supply to carry the drugs to the site of infection. It is perhaps in the spine that this method has the most hopeful possibilities. Thirdly, the treatment and prevention of sinuses is now much easier, and the unhappy sight of a patient dying of chronic sepsis and amyloid disease is almost a thing of the past. As MUKOPADHAYA [3] has shown, in countries where patients seek advice late in the illness and where there is little chance of their staying long in hospital, it is as an aid to surgery and a means of dealing with sinuses that chemotherapy has proved most helpful.

Both in the lungs and elsewhere, tuberculosis is steadily on the wane. No longer does the treatment of pulmonary tuberculosis occupy the greater part of the thoracic surgeon's time; and in orthopædics tuberculosis is almost entirely confined to a few hospitals, so that the young orthopædic surgeon working outside them may be coming to regard a new case as a rarity. In one large children's country hospital the number of tuberculous cases has diminished in recent years by as much as 70%. Outside these hospitals the surgeon's task is to make an early diagnosis so that treatment may begin before the bacillus has time to make itself a stronghold within necrotic bone cavities. When chemotherapy is used as a prelude to removal of the focus, TRUETA et al.[4] have shown that, even if bone is already involved, the shorter the history the better the results.

In spite of this progress we are still sometimes confronted with the puzzling patient in whom the presence of tuberculosis is no more than a suspicion; the hip and knee are the joints most often involved. The "observation joint," in fact, is still with us. Should the condition prove to be tuberculous it is in just such patients that early chemotherapy is most valuable; and it is no longer justifiable to submit the patient to a long period of observation without its benefit. On the other hand, the complications of chemotherapy, though rare with the doses nowadays used, are such that it should be avoided for the non-tuberculous patient. The clinical and radiographic appearances, blood examination, and skin reactions may be deceptive or equivocal; and then biopsy, with which is included joint aspiration, is justifiable—and indeed essential. Considerations such as these have led Mr. MILLS and his colleagues to describe, in a valuable paper on p. 57, the results of a policy of early biopsy. The average length of history in their patients was admirably short—two months for synovial lesions, four months for osseous lesions. When neoplasia is suspected, the presence or absence of malignancy may be disputed by the pathologists; but here false positives need not be feared, at least where the lesion itself and not a lymph-gland is the source of the material. Each specimen must be examined histologically and by culture and inoculation. There may be false negatives, however, particularly in gland biopsies for bone lesions; but here there are cogent reasons for attacking the bone itself, where biopsy can often be combined with removal of the entire lesion.

Mr. MILLS and his colleagues emphasise the danger that lengthy treatment with streptomycin may alter the histological appearances beyond recognition; but they believe that brief treatment does not endanger the accuracy of their results. A negative biopsy is of course significant, but the progress of the joint itself is still the dominant consideration; and a negative biopsy must not be taken as a sign to stop conservative treatment when it is indicated on purely clinical grounds. It is noteworthy that most of their patients in whom tuberculosis could not be proved received chemotherapy—in spite of a negative biopsy; in the absence of a decisive indication, the wise surgeon must still rely on his clinical judgment.

1. Stevenson, F. H. *J. Bone Jt Surg.* 1954, **36B**, 5.
2. MacKenzie, I. G. *Lancet*, 1954, **i**, 652.
3. Mukopadhaya, B. *Ann. R. Coll. Surg. Engl.* 1956, **18**, 288.
4. Trueta, J., Shipsey, E. M., Trias, A. *Brit. J. Tuberc.* 1956, **50**, 105.

Blood and Sodium

STUDY [1 2] of the changes in the total bodily composition of patients undergoing operation has demonstrated that the so-called metabolic response to surgical or accidental injury exhibits some characteristic features. An early katabolic phase, marked by large losses of potassium and nitrogen, with conservation of sodium, is followed by an anabolic phase, in the early days of which potassium and nitrogen are conserved and sodium lost. There has been general agreement that these features are evidence of the normal response to severe injury and to the ensuing inflammatory reaction and process of healing. In much of this work on the effects of injury no allowance has been made for blood lost during the operation, or subsequently into the injured tissues, or gained by transfusion, even when the amounts of such losses or replacements were known. Recently, FLEAR and CLARKE [3] have emphasised the importance of large blood-transfusions in the treatment of severe accidental injuries, and they have examined the effects these large transfusions may have on the composition of the urine and on metabolism. They studied 16 patients with injuries of similar severity, who were divided into two groups: in the first group 12 patients were transfused with whole blood as a primary measure of treatment; the 4 patients in the second group received no blood. The adequacy of blood replacement by transfusion was judged by comparing the red-cell volume at the time during the first forty-eight hours when blood-loss had apparently ceased with the red-cell volume during convalescence. They found that in the patients who were not transfused the metabolic pattern was similar to that already described by CUTHBERTSON [1] and others. Patients who, by FLEAR and CLARKE'S criteria, were adequately transfused did not behave in this way: sodium retention lasted for one day only; an initial increase in potassium excretion was found only in association with a raised intake; and the nitrogen loss was smaller and apparently delayed. They therefore suggested that the loss of blood and reduction of the actively circulating volume of blood are major factors in the production of the metabolic changes after injury, and that the concept of a fixed pattern of response to injury is an over-simplification and may induce a wrong attitude to treatment.

Not everyone will agree with their conclusions. The main difference between their results and those of earlier workers lies in the larger urinary sodium excretion of transfused patients during the first six days after injury; although there was some indication that sodium excretion fell, the reduction was slight compared with that in the untransfused patients. Over a period of fourteen days the mean cumulative balance of sodium was −381 m.eq. in the transfused and +23 m.eq. in the untransfused patients. During the same fourteen days the transfused patients lost 59 m.eq. and the untransfused patients 43 m.eq. of potassium. The nitrogen losses were 48 g. and 95 g. respectively. The cumulative mean urinary excretion of sodium and potassium were both greater in the transfused than in the untransfused patients. It might be judged from these figures that at the end of fourteen days the transfused patients were rather worse off than those who were not transfused. The apparent improvement in the nitrogen balance may be due to slow metabolism of protein introduced by transfusion and not to true reduction in protein katabolism or increased tissue synthesis. Even in the transfused patients, the pattern is not consistent; potassium balance was positive in only 4 out of 7 and was negative in the other 3 and in those who were not transfused; a large negative balance of sodium was found in only 5 out of 7 patients. It seems likely that a number of these patients were overtransfused with cells and that most of these had a negative sodium balance, whereas those who were given too little blood, or none at all, reached positive sodium balance over the first six days. More urine was produced from the second day onwards by the transfused group than by the others, who, incidentally, drank more. Unfortunately, urinary volume and water intake are not recorded for the 3 patients who gained weight during the first week.

FLEAR and CLARKE may justifiably claim that by the free use of blood-transfusion they have altered the pattern of urinary excretion after injury; but they have not greatly improved the general state of balance at the end of fourteen days, nor is it easy to see what metabolic benefit follows the abundant transfusion they advise. Massive blood-transfusions may not be free of risk, and their efficacy in completely restoring blood-volume to normal is uncertain. PRENTICE et al.[4] found that, in spite of very large transfusions of whole blood, blood-volume was not restored to normal, and that as the total volume of blood transfused rose so did the residual deficit in circulating blood-volume. These observations are of interest and perhaps not without bearing on the large excretion of sodium which followed transfusion in those of FLEAR and CLARKE'S patients whose hæmoglobin was above normal after transfusion. They have remarked that sodium retention after injury may be a means of maintaining an adequate volume of blood in circulation.[5] They quote the observations of STRAUSS and FOX [6] that water is retained by sodium-loaded anæmic patients, and they suggest that when blood-volume is fully restored after injury sodium retention is unnecessary. Their own observations indicate that when the hæmoglobin concentration approaches or exceeds 100%, sodium excretion is higher than in patients whose hæmoglobin is below 80% of the convalescent value. Hæmodilution would be most likely in those patients who best conserved sodium after injury. On the other hand, the association of an elevated hæmoglobin concentration with a large sodium excretion may be due to excessive transfusion and the reduction of an expanded plasma-volume by renal excretion. LE QUESNE and LEWIS [7] showed that sodium and

1. Cuthbertson, D. P. *Biochem. J.* 1930, **24**, 1244; *Quart. J. Med.* 1932, **25**, 233; *Brit. J. Surg.* 1936, **23**, 505.
2. Howard, J. E., Parson, W., Stein, K. E., Eisenberg, H., Reidt, V. *Bull. Johns Hopk. Hosp.* 1944, **75**, 156. Howard, J. E., Winterwitz, J., Parson, W., Brigham, R. S., Eisenberg, H. *Ibid*, p. 209. Moore, F. D., Ball, M. R. Metabolic Response to Surgery, Springfield, Ill., 1952. Wilkinson, A. W., Billing, B. H., Nagy, G., Stewart, C. P. *Lancet*, 1949, i, 640; *Ibid*, 1950, ii, 135, 533.
3. Flear, C. T. G., Clarke, R. *Clin. Sci.* 1955, **14**, 575.
4. Prentice, T. C., Olney, J. M. jun., Artz, C. P., Howard, J. M. *Surg. Gynec. Obstet.* 1954, **99**, 542.
5. Borst, J. G. G. *Acta med. scand.* 1948, **130**, suppl. 217.
6. Strauss, M. B., Fox, H. J. *Amer. J. med. Sci.* 1940, **200**, 454.
7. Le Quesne, L. P., Lewis, A. A. G. *Lancet*, 1953, i, 153.

water loading disturbed the normal urinary excretory pattern after operation, and led to a large urinary output of sodium. Disturbance of the so-called "normal" pattern of urinary excretion by large intakes of saline solution or blood should not be too readily interpreted as modifying normal response to injury, and careful judgment is needed before such modifications are held to be beneficial.

These interesting observations provide more information about the response of the human body to injury, but they do not justify the claim that blood-transfusion will reduce the ultimate demands on the intact tissues of the body for the components of the processes of inflammation and repair. Nor is it unusual that that is so: it would be more surprising if it were possible so easily to modify the reaction to injury on which survival appears so largely to depend.

Pleuropericarditis

ACUTE inflammation of the pericardium and pleura is usually caused by rheumatic fever or tuberculosis, and less commonly by pyogenic organisms, trauma, or uræmia (although in uræmia the pericarditis is asymptomatic). Perhaps because of improved standards of living and the coming of antibiotics, these causes of pleuropericarditis are less common than they used to be; and attention has turned to less well understood conditions. One of these, recently described by DRESSLER,[1] is a complication of myocardial infarction. The syndrome, which comprises sustained and recurring pyrexia, pain in the chest, and a pleural effusion, may immediately follow the initial cardiac episode, and the continued fever may then suggest its presence; or it may be delayed for from one to eight weeks. During the acute phase, which may recur, the temperature rises to 101–102°F with occasional peaks of 104°; and it seldom falls below 100° during the remissions. The pain is felt over the centre of the chest and precordium, and also in the left lower hemithorax. Diaphragmatic involvement may produce pain in the left shoulder. The pain is cutting or stabbing and is aggravated by deep breathing or changes in posture. When the pain begins, the fever usually increases; but often there is a disparity between the height of the fever on the one hand and the severity of the chest pain and the physical findings on the other. Pericardial friction is usually to be heard, and half the patients have a pleural effusion, either bilateral or confined to the left side. X-ray examination, particularly if several films are taken, may show a sudden increase in cardiac size, indicating a pericardial effusion, and confirm the presence of a pleural effusion. In the electrocardiograms there may be changes of acute pericarditis in addition to those of myocardial infarction. A leucocytosis and increase in sedimentation-rate accompany the acute exacerbations, which last for seven to ten days and may recur as often as six times in a period of several weeks or months. Despite this tendency to relapse the prognosis is good. The fever is uninfluenced by antibiotics but responds to salicylates or cortisone, which improves all the manifestations of the syndrome.

1. Dressler, W. *J. Amer. med. Ass.* 1956, **160**, 1379.

The importance of this syndrome, if it does indeed prove to be a specific entity, lies in distinguishing it from more common and better-known accompaniments and complications of myocardial infarction. Fever, attributed to necrotic tissue, is common on the second or third day after a myocardial infarct but seldom persists for longer than a week, nor does it relapse; and it is often accompanied by a transient leucocytosis and increase in sedimentation-rate. Extension of the infarct may cause a recurrence of ischæmic pain, pericarditis, fever, and leucocytosis, but usually there is clear-cut E.C.G. evidence of the extension. Similarly the development of a myocardial aneurysm may be associated with a prolonged pericardial rub, a small hæmopericardium, and a pleural effusion; but high fever is not a feature, the E.C.G. and fluoroscopic findings are characteristic, and there is no tendency to multiple relapses. Pulmonary infarction may mimic DRESSLER'S syndrome, but hæmoptysis is usual if there are repeated episodes and the radiological findings are more definite.

The cause of the pleuropericarditis is unknown: laboratory investigations aimed at isolating an infective agent were unrevealing. Anticoagulants may cause a hæmorrhagic pericardial effusion,[2] but in some of DRESSLER'S patients the syndrome appeared before such treatment was begun and it recurred in others after it had been stopped. In many ways the condition resembles the post-commisurotomy syndrome, which is another type of pleuropericarditis affecting about 10% of patients who have been operated on for relief of mitral stenosis.[3–5] The main features are a relapsing pyrexia, stabbing central chest pain, aggravated by deep breathing and movement, a pericardial rub with E.C.G. evidence of acute pericarditis, and sometimes radiological signs of a pericardial effusion. Pain in the left chest, with the development of a sterile blood-stained pleural effusion, may follow. The condition may arise immediately after the operation or be delayed for several weeks. The prognosis is good and there is no evidence that the success of the operation is jeopardised. Reactivation of the rheumatic process has been suggested as the cause,[3] but usually there is no preceding streptococcal infection, arthritis, or change in the heart murmurs; serological tests do not support a rheumatic origin, nor does the fever show any convincing fall when salicylates are given. Other suggested causes are infection of the lingula lobe [6] and surgical trauma.[4 7] Prolonged oozing from the atrial wound into the pleuropericardial space may be a factor,[5] but it is hard to understand why this should first become manifest weeks or months after operation. Perhaps both the post-infarction and post-commisurotomy syndromes are allied to another pleuropericardial condition called "benign idiopathic recurrent pericarditis" [8] which may appear in otherwise healthy adults without any evident predisposing cause but which in its manifestations is indistinguishable and equally puzzling.

2. Goldstein, R., Wolff, L. *Ibid*, 1951, **146**, 616.
3. Soloff, L. A., Zakuchni, J., Janton, H., O'Neill, T. J., Glover, R. P. *Circulation*, 1953, **8**, 481.
4. Bercu, B. A. *J. Lab. clin. Med.* 1953, **42**, 783.
5. Papp, C., Zion, M. M. *Brit. Heart J.* 1956, **18**, 153.
6. McAllister, F. F. *Amer. J. Med.* 1953, **14**, 2161.
7. Elster, S. K., Wood, H. F., Seely, R. D. *Ibid*, 1954, **17**, 826.
8. Dressler, W. *Ibid*, 1955, **18**, 591.

Annotations

THE MORTALITY OF ANÆSTHESIA

SEVEN years ago the Association of Anæsthetists set up a committee to inquire into the causes of death associated with anæsthesia, and their report on the first 1000 cases has now appeared.[1] The standard of practice and teaching in anæsthesia in this country is high and this investigation was not undertaken to determine the relative competence of the anæsthetists. The object was rather to determine what were the commonest causes of death in association with anæsthesia, and if possible to make recommendations that might help to reduce the risk. An "anæsthetic death" is rare in the clinical practice of a single individual, but if all the various disasters are grouped together then it is possible to identify certain errors of technique. Dr. Edwards and his colleagues deserve great credit for the way they have gathered and analysed the information.

Out of the 1000 possible cases submitted from hospitals throughout the country, the committee decided that 598 could be accepted as associated with anæsthesia. Two particular causes of death—both during induction of anæsthesia—stand out because together they account for over a third of the total; and for this reason alone they warrant very careful study. Firstly, regurgitation and vomiting soon after loss of consciousness is still one of the greatest dangers of anæsthesia. The rigid enforcement of the rule that no fluids or solids must be taken by a patient for four hours before the induction of anæsthesia may seem unnecessary and irksome at times; but both doctors and nurses should be fully aware of the dangers of a full stomach before anæsthesia. The committee strongly recommend that whenever there is the slightest suspicion of the accumulation of gastric contents—for example, in acute emergencies, in intestinal obstruction, or in hæmatemesis—then a 12-gauge (7 mm.) œsophageal tube should be passed and the gastric contents aspirated whilst the patient is still conscious. The committee criticise the practice of giving glucose by mouth to diabetic patients just before operation; this, they felt, had been responsible for 5 deaths which could probably have been avoided if the glucose had been given intravenously. The cuffed endotracheal tube has reduced the risk of inhalation of gastric contents during the operation, but in the immediate postoperative period inhalation is still too common. Few hospitals have a recovery-room near the operating-theatre, and that makes it hard for the anæsthetist to remain responsible for the patient until he has recovered consciousness, so that it is more than ever important to provide an adequate airway, to keep the patient in the lateral position, and to ensure that the nursing staff are adequately trained in the care of the unconscious patient. Otherwise, the risk of inhalation will never be eliminated.

It is interesting to note that, although inhalation of vomited gastric contents is a prominent cause of maternal mortality in obstetrics, the committee do not make any positive recommendations about the use of gastric suction or endotracheal intubation as a routine. The skill and training of the individual anæsthetist are considered to be of the highest importance. Clearly this branch of anæsthesia requires further development and at present it is impossible to define an ideal technique.[2]

The other important cause of death during induction of anæsthesia was circulatory failure due to the intravenous injection of thiopentone. In nearly every case the preoperative condition was assessed as poor or very poor, and a third of the patients had severe heart-disease. Some died rapidly after the injection of as little as 0·15 g. or as much as 0·75 g. The inexperienced may easily be misled when assessing a patient's condition, so that it is particularly important to emphasise that thiopentone should never be given to "poor risk" patients. The place of thiopentone in modern anæsthesia is largely that of a hypnotic for the pleasant induction of unconsciousness, and large doses are now unnecessary.

Apart from these two main causes, a number of deaths were attributed to chloroform and surprisingly to trichlorethylene. Trichlorethylene has hitherto been regarded as relatively non-toxic, but the committee cite 12 deaths for which it was blamed. 3 were considered to be directly due to too high a concentration, but in the other 9 the cause of death was reported as "primary cardiac failure" after the inhalation of relatively small quantities of trichlorethylene. Many other causes of death, such as laryngeal spasm, inhalation of excessive quantities of carbon dioxide, respiratory obstruction, and bronchospasm, are also recorded.

This important document should be read by all who administer anæsthesia, and the recommendations of the committee should be heeded by all who teach this subject.

1. Edwards, G., Morton, H. J. V., Pask, E. A., Wylie, W. D. *Anæsthesia*, 1956, **11**, 194.
2. See *Lancet*, 1956, **i**, 734.

INTERNATIONAL SOLIDARITY

FROM the earliest days epidemics, spread indifferently by warlike invaders or peaceful pilgrims, have warned us that health is indivisible. Today modern transport has brought us all within uneasy as well as easy reach of each other, and, as Dr. Etienne Berthet pointed out at the first meeting of the Louis Rapkine Association,[1] a louse infected with typhus, falling from a beggar's rags in a Middle East bazaar on to the clothes of a Western business-man, may in a few hours be in London or Paris where it will land full of life and ready to set off a serious epidemic. But if science exposes us to new dangers it offers us new means of defence. Today we have more effective means of preventing, controlling, and curing disease than ever before, and in the last ten years or so, through the international organisations, we have made a start with global medical practice. As director of the International Children's Centre, Dr. Berthet is able to speak of these developments with authority, and in his survey of contemporary medicine he pointed out that the work was all the more important because it was being undertaken not only, or even chiefly, with the idea of protecting the health of the developed nations, but because we had come to accept health as one of the fundamental rights of every man, woman, and child. With this changing climate of opinion it was all the more unfortunate that the distribution of modern medicine was being held up by lack of doctors. The world had 1,200,000 doctors, but they were very unevenly scattered over the globe—1 for 10,000 inhabitants in Africa compared with 1 for 1000 in Europe. Every year 55,000 new doctors were trained; some twenty years would thus be needed to produce enough doctors, and by that time the population would have outstripped them.

With this and other inconvenient habits of patients Dr. Berthet sympathised, and he pleaded the cause not only of the undeveloped but also of the maladjusted. Indeed he wondered whether we do not use that word over-freely and from a sense of guilt. Modern life puts a great environmental strain on many people. Those in developed countries, he recalled, are subject to the rush, complexity, and mechanisation of modern civilisation. Those in undeveloped countries face the even greater strain of moving straight from a camel's back to an aeroplane without the intermediate experience of a stage-coach or a train. Is it, he asked, reasonable to consider maladjustment a matter of individual pathology; is it not really a problem of social pathology? Dr. Berthet warmly acknowledged the power of modern medicine, but he wondered if it sometimes cured the disease at the

1. Held at the Ciba Foundation on May 14; see *Lancet*, 1956, **i**, 972.

expense of the patient. He felt that it was in some danger of becoming a study of quantity rather than of quality. Beset with new techniques, instruments, and aids to diagnosis and prognosis, medicine, he suggested, should consider the advice of René Leriche "to recover its breath under the plane trees of Cos."

CLEAN RIVERS?

THE Water Pollution Research Board does not include among its learned members a single medical man. Had the board existed in the days of Budd and Simon the omission would have been unthinkable, but today it is no more than confirmatory evidence that the need for drinking-water free from fæcal pollution is accepted as an axiom.

Research in water pollution concerns itself nowadays with water as an amenity rather than as a vital fluid; but is not the less important for the change of emphasis.[1] All over the country there are streams, where our elders fished, which support no life today but anaerobic bacteria. They look nasty and smell worse, and inescapable gravity spreads their nastiness for many miles downstream. The consequent risks to bathers and others are hard to assess but cannot be overlooked. Commercial fisheries have been ruined and water made unfit for industrial uses. The main causes of damage are poisons (such as cyanides), organic refuse which robs the water of oxygen, and—a new hazard whose effects are not yet fully comprehended—the synthetic detergents used in every home.[2] An "iceberg" of foam five feet high is a dramatic and not unlovely sight, but its effect on plant and animal life seems to be uniformly deleterious.

Like our patients, no two rivers are identical: they differ in physiology and habit as well as in anatomy. There is no bold cure-all to be applied at all times in all places. The foul fluid which passes and repasses under Westminster Bridge comes from the limpid springs of the Cotswolds and, once below the Nore, dances in pellucid waves under the summer sun. The causes of this double metamorphosis are a problem large enough to daunt any investigator; but, bit by bit, the parts played by sewage and industrial effluents, by hot water from the generating-stations, and the healthy breezes off the Essex marshes are being understood. Shall we ever again see the Thames bright with running salmon? Not in our lifetime; but perhaps the streams of the Black Country will be a delight and not a disgrace and trout will rise again in the upper Lea. If the casual reader thinks that fishing interests occupy too much of the board's attention let him remember how much the general enthusiasm for clean rivers owes to the *saeva indignatio* of a hundred thousand anglers.

NEEDLE BIOPSY OF THE THYROID

NEEDLE biopsy of the liver is an accepted aid to diagnosis. The liver is an ideal organ for this technique. Too large to miss, it is not too friable or vascular, and, above all, it is reasonably uniform in its histological appearance, so that a tiny piece of tissue can indicate the structure of the whole. Elsewhere, the technique has been less successful. At first sight the thyroid seems unsuitable for attack by needle biopsy. The normal gland is so small that the needle might easily miss it and endanger other important structures. Moreover, the thyroid is normally quite vascular, and the over-active gland is excessively so. Finally, thyroid histological appearances are hard to interpret and vary greatly from one area to another. In spite of these discouraging thoughts Crile and Vickery[3] reported favourably on needle biopsy in patients at the Cleveland Clinic. Complications were so few that they were able to recommend the method as an "office procedure."

Hamlin and Vickery,[4] who now describe 175 biopsies done with the Silverman needle at the Massachusetts General Hospital, were more cautious, for all their patients were in hospital and full aseptic precautions were taken. The only complications were three hæmatomas, which were not large enough to interfere with respiration and did not require exploration. The patients were attending the thyroid clinic and were carefully selected. The needle was not used in suspected thyrotoxicosis or cancer, the contra-indication in cancer being the fear of spreading malignant cells along the track of entry. By far the commonest indication was the possibility of thyroiditis. Chronic thyroiditis is notoriously difficult to distinguish from nodular goitre and often becomes apparent only at operation. Since both subacute and Hashimoto's thyroiditis are usually amenable to medical treatment, needle biopsy might well obviate a number of thyroidectomies. At the thyroid clinic of the Massachusetts General Hospital the number of cases of thyroiditis diagnosed in three years has been doubled by the introduction of needle biopsy. Hamlin and Vickery comment frankly on the difficulty of making a certain diagnosis on a piece of tissue no more than 2 cm. long and 2 mm. wide; and they merely say that they are adding one more piece of evidence to the complex which goes to make up a diagnosis. But practice evidently increases the proportion of cases in which an informative piece of tissue can be secured, and in their last 55 attempts Hamlin and Vickery obtained useful information in 80%. Needle biopsy is evidently a procedure which has its uses, though it should be confined almost exclusively to cases where thyroiditis is a possibility.

FALL-OUT FROM NUCLEAR WEAPONS

RADIOACTIVE iodine is a product of nuclear fission, and it appears in fall-out after the explosion of nuclear and thermonuclear weapons. Since radioactive iodine is concentrated in the thyroid gland, and ^{131}I decays by beta and gamma ray emission, its detection in thyroid glands is relatively simple. Van Middlesworth[5] has investigated over a period of 70 weeks (October, 1954, to March, 1956) the radioactive content of thyroid glands from cattle, sheep, and man. The investigation was conducted at Memphis, Tennessee, and the cattle, at least, are stated to have been unselected and raised within 200 miles of Memphis—i.e., about 1200–1500 miles from the nearest known testing-grounds for nuclear weapons, in Nevada. In addition to glands from local animals, cattle and sheep thyroids from Germany, Canada, Japan, and England were also examined. The 175 human thyroid glands studied came from necropsies carried out in Memphis. The radioactivity in the thyroids was considered to be due to ^{131}I, and it could easily be measured in cattle and sheep thyroids and also in the human glands (though the activity was lower). Moreover, the radioactive content of the glands could be correlated in time with the explosion of nuclear weapons; the higher values were recorded shortly after bombs had been exploded. No estimate was made of the differences in fall-out after different types of explosion—that is, nuclear as opposed to thermonuclear weapons.

For the summer and autumn of 1955 (April–November), the radiation dose to the thyroid varied from 0·15 r.e.p. (röntgen equivalent physical) per thyroid for English cattle to 13·0 r.e.p. for Memphis cattle. It is not stated whether this is a maximum or mean thyroid dose; but the highest recorded activities in Memphis cattle in June, 1955, were over 10 millimicrocuries per g. of thyroid.

If these findings are confirmed they are extremely disturbing. They indicate widespread contamination,

1. Water Pollution Research 1955. Department of Scientific and Industrial Research. London: H.M. Stationery Office. 1956. Pp. 81. 4s.
2. See *Lancet*, 1956, i, 1059.
3. Crile, G. W., Vickery, A. L. *Amer. J. Surg.* 1952, **83**, 83.
4. Hamlin, E., Vickery, A. L. *New Engl. J. Med.* 1956, **254**, 742.
5. Van Middlesworth, L. *Science*, 1956, **123**, 982.

at least of the Northern Hemisphere, by short-lived fall-out containing ^{131}I from test explosions. The information on radiation dosage is limited, but it seems that a dose varying, according to the species, from a fraction of 1 r.e.p. to several r.e.p. is being delivered to each thyroid every year from this fall-out. On this evidence, an appreciable lifetime radiation dose to the thyroid beginning early in embryonic life is to be expected if test explosions continue at their present rate. The ultimate effects of this type of irradiation in man are unknown. Moreover, if radioactive iodine is being deposited from fall-out and absorbed, it is virtually certain that other important short-lived isotopes, such as barium 140 and strontium 89, are also present. We have lately expressed concern at the possible danger from long-lasting isotopes, particularly strontium 90 [6]; and it now seems that other radioactive poisons may be at work. Last week [7] Dr. Ralph Lapp, an American physicist, challenged the conclusion that test explosions could be allowed to continue at the present rate without endangering health. He is reported as estimating that, on the assumption that the rate of firing will have doubled by 1970, there would be, by 1962, enough radioactive strontium committed to the atmosphere to contaminate the world's population with the "maximum permissible amount." This may be putting the threat too high; but there can be no doubt that to continue to explode bombs is to take a risk of which we know very little and which may ultimately endanger life unless we act at once.

PREVENTIVE MEDICINE IN THE ARMED FORCES

SERVICE life is associated with special hazards to health which call for skilled prevention; and the steady improvement in the health of Servicemen, and the reduced loss of man-power from avoidable disease, indicate how well this task is being performed. History shows that disease can play greater havoc in the ranks of an army than enemy bullets; but in the war of 1939–45, despite great risks, the disease incidence was lower in our Forces than ever before.

Service doctors are now using the special opportunities at their disposal to advance into the new fields of preventive medicine and public health. Significantly, after the war the Army changed the title of its hygiene branch to that of Army health, and included in the definition of its duties the attainment, maintenance, and improvement of physical and mental health as well as the prevention of disease. All three Services are contributing to this work, the results of which are being utilised in civilian practice. Notable research by the Services includes studies in connection with immersion and exposure to heat and cold; high-speed flying; personnel selection; load-carrying; insect control; and epidemiology and health education.

The first report by the Forces Medical and Dental Services Committee (the Waverley Committee) [8] contains many references to prevention, hygiene, and public health, and recommendations about the reorganisation of this branch of Service medicine. The committee emphasises the importance of keeping personnel constantly fit, and impressing this doctrine on junior medical officers "with greater force than has hitherto been done." All junior general-duty and administrative officers, it says, should be associated with the task; which implies that not all take part in it at present. Another (and admirable) suggestion is that all regular medical officers, other than clinical specialists, should obtain the diploma in public health or its equivalent.

At present the hygiene (Army health) officer is classified as a specialist, and receives specialist pay in the same way as his colleagues in medicine, surgery, pathology, and other branches of medicine; but the committee believes that there is no need for hygiene specialists in ranks below that of lieut.-colonel. This arises from its remarks about indoctrinating junior medical officers; and it calls attention to the importance of inspecting quarters, cookhouses, and latrines, and regularly examining personnel. None will disagree that this work is very important; but such work (which forms only a small part of Army health work) is already the duty of the unit medical officer, who is trained for it. Nevertheless, it is the commanding officer who, guided by his medical officer, is ultimately responsible for the health of his troops; and it is surprising that the committee did not emphasise this.

The committee, it seems, has largely failed to appreciate that the hygiene specialist is far more than a sanitary policeman—an impression reinforced by references in the report to over-specialisation in preventive medicine, and to the desirability of many junior administrative posts being filled by non-medical officers. The needs of hygiene and public health vary greatly between the three Services, and the suggested changes would have the most unfortunate consequences in the Army. This would assuredly be the case in time of war (and we assume that the report refers to war as well as peace), when the directorate of Army health would not only have special problems in connection with the soldier but would also be required to undertake much work for the other Services and would, in addition, have even wider responsibilities for civilian public health than in the late war. While a diploma in public health would be advantageous to every medical officer, diplomates are not necessarily specialists. Furthermore, in view of the present shortage of medical officers (to which the committee calls attention) it is not easy to see how junior officers could be spared to attend at least a year's full-time course for the D.P.H. The elimination of the junior hygiene specialist would be retrograde, and we hope that any such change will be resisted.

RETIREMENT OF SIR JOHN STOPFORD

FEW excel in more lines than one. Of this small band is the retiring vice-chancellor of Manchester University; for Sir John Stopford has won renown successively as clinical neurologist, teacher of anatomy, university administrator, and medical educationist. It is close on fifty years since he became a medical student at Manchester, the scene of his whole career. Qualifying in 1911, he took up anatomy. His neurological knowledge had full scope during the first world war, and in 1919, at 31, he became professor of anatomy. He stood revealed as an ideal teacher—clear, simple, and brief.

In the wake of the chair came academic chores, among them the deanship. While thus occupied, he continued his prolific output of scientific papers, whose merit was recognised by election to the Royal Society when he was only 39. His best-known work is on the blood-supply to the pons and medulla, but he ranged widely outside as well as within neuro-anatomy. In 1934 he left anatomy with reluctance to become vice-chancellor. His success was marked by honorary degrees and the proud and unique title of "prince of vice-chancellors." During the war he embarked on the forward-looking task of the Goodenough Committee on Medical Schools.

Stopford's greatness is not in doubt among those who worked with him. With clear perception, quick decision, and resolution, he combines modesty, humanity, and humour. The medical profession, no less than his beloved university, offers its thanks, and wishes both him and Lady Stopford health in retirement, and the rich recollections of a well-spent life.

LAST week, at their first meeting, the General Dental Council elected Sir WILFRED FISH as their president.

6. *Lancet*, 1956, i, 999.
7. See *Times*, July 6, 1956.
8. Forces Medical and Dental Services Committee: First Report. H.M. Stationery Office, 1956. See *Lancet*, 1956, i, 334.

Special Articles

PULMONARY TUBERCULOSIS IN CHILDHOOD AND ADOLESCENCE

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THERE has always been uncertainty about the correct management of tuberculous children and adolescents. The recent striking decrease of tuberculosis in no way minimises the importance of abolishing this uncertainty.

Institutional Care

Whereas tuberculosis in children used to be thought to be fraught with grave danger, opinion changed to such an extent that the view was expressed that sanatoria for children were a complete waste of public funds (Myers 1938). Yet many children continued to receive prolonged institutional care, and Price (1948) was a confirmed advocate of the importance of rest in bed for them. The problem was discussed at some length by Bentley et al. (1954).

Antibiotics and Rest

Today, though we know much more about the risks run by tuberculous children, we are still without convincing proof of the value of prolonged rest. With the advent of antibiotics emphasis has shifted, and there is now far less discussion on the place of rest in treatment, though practice continues to vary widely in different centres. Attention is now being focused, and much diversity of opinion revealed, on the proper place of chemotherapy.

An attempt has been made to crystallise the different views held by 18 chest physicians on this important matter:

Most of them are in favour of antibiotic treatment of segmental lesions but not of cases that have not yet gone beyond the phase of a primary complex. This seems to point to a belief in obtaining an immediate favourable effect rather than a long-term prophylactic one.

There was a majority opinion in favour of giving antibiotics to children aged less than 2 years. Though this opinion seems to be founded on a belief of the prophylactic efficiency of antibiotics against bloodborne disseminations, this view did not seem to be sufficiently strongly held to support the giving of antibiotics to older recently infected children. Nor did there seem to be much faith that the administration of antibiotics in primary infection in childhood could influence the incidence of tuberculosis of adult type in subsequent years.

It is significant that we still have to use such words as "belief" and "faith." Clearly our knowledge is sadly incomplete, and opinion was virtually unanimous that a planned trial was required.

Surgery

With increasing efficiency in thoracic surgery efforts are being made here and there at radical surgical treatment of primary tuberculosis. Yet another problem which demands an answer as early as possible is the best method of treatment for those rare cases of tuberculosis of adult type in children and adolescents. Should antibiotics be combined with collapse therapy, or are drugs alone sufficient? And which of these cases should undergo resection?

Reasons for Past Neglect

It is indeed curious that a disease in which innumerable cases have been under observation for decades through our public-health schemes should still give rise to so many important differences of opinion, and it is interesting to speculate on the reasons. The main explanation is probably that the great majority of deaths from tuberculosis have always been in adults, and consequently tuberculosis has been studied chiefly from this angle.

Before the present decrease of tuberculosis, chest physicians tended to be overwhelmed with adult patients whose condition was serious and required the utmost of their attention. The study of tuberculosis in children was perforce neglected. Unfortunately the lessons learnt from tuberculosis in adults are usually completely irrelevant to the treatment of tuberculous children. One might almost say that the only factor common to both tuberculosis in adults and tuberculosis in children is that they are caused by one and the same bacillus. Otherwise tuberculosis in children follows an entirely different clinical pattern and consequently calls for completely different management. The tuberculous child has too often been made to follow the strict pattern of rest evolved in the treatment of adults. Though the value of such rest has been proved in adults, similar evidence has never been forthcoming for children.

After pulmonary tuberculosis has been quiescent for about 5 years in an adult, it may be suitable to remove his name from the tuberculosis register as "recovered," but it would not be right to do so with a young child. Thus, to stop supervising a child whose tuberculosis has been quiescent for 5 years by his 9th birthday shows a complete disregard for the natural evolution of tuberculosis, because with the onset of puberty begins a new danger period from the possible supervention of tuberculosis of adult type.

Again, although in the days before antibiotics it was proved in adults that prognosis was directly related to the extent of the pulmonary lesion revealed by X rays, the application of this knowledge to pulmonary tuberculosis in children has proved irrelevant and indeed damaging to a proper conception of the evolution of tuberculosis in the child. So different is tuberculosis in children that, as has been pointed out (Bentley 1955), an assessment of antibiotics in children would call for criteria additional to, if not totally different from, those used in adults, where sputum conversion and radiological retrogression are all-important. In the very young child the most important result to look for would be a reduction in the expected rate of hæmatogenous complications. In the child round about puberty assessment would depend largely on whether or not tuberculosis of adult type supervened subsequently.

Another reason underlying our lack of knowledge of tuberculosis in children has been the tendency for the few seriously ill, particularly those with tuberculous meningitis and those with miliary tuberculosis, to gravitate towards pædiatric departments, while the chest physicians have dealt with the seemingly never-ending procession of more or less symptomless child contacts. Thus it came about that tuberculosis officers observed the optimistic side of the picture while pædiatricians obtained a gloomy outlook about tuberculosis in childhood. Neither group of observers has been in a good position to get a balanced and impartial picture of tuberculosis in young people. All this has given rise to uncertainties and confusion. Neglect of the study of the tuberculous child has been such that few chest physicians (or pædiatricians) have undergone any special training in this important branch.

The Position Today

Today tuberculosis in children is still a neglected branch of chest disease, and the coming of the antibiotic era has raised new problems at the same time as it has further diminished the material on which sound answers can be based. The incidence of tuberculosis in children has fallen strikingly since the adult pool of infective cases has been reduced by antibiotic therapy. Consequently the number of children with demonstrable pathological shadows in the chest due to tuberculosis has lessened, and the amount of clinical material available to each chest physician, either in clinic or in hospital practice, is

far smaller than it used to be. It has, as a result, become quite beyond the resources of individual physicians to assess antibiotics in different types of tuberculosis in children.

The question might be asked whether, in view of the recent striking decrease of tuberculosis, which will probably continue, it is worth while to try to elucidate problems which appear to be dissolving before our eyes. Is not tuberculosis in children in England a problem of the past? In 1954 less than 200 young people in the first 15 years of life died of tuberculosis; but there were still 6000 new cases notified in that year, and this could represent only a fraction of the number of children infected.

Attention has been called (Ministry of Health 1954) to the increasing importance of primary infection in tuberculosis of adults. Certainly of the 40,000 new adult patients who came to light in 1954 many must have been infected in childhood, and a large number must have broken down as a direct result of continued smouldering disease following initial infection in early years.

Nor can this subject be looked at from an insular angle. England, and London in particular, continues in medicine, as in many other respects, to be the centre of a still considerable commonwealth of nations. All those, especially in the Metropolitan area, concerned with the teaching of postgraduates must be impressed with the many different countries, even outside the Commonwealth, represented in their classes. Many of these doctors come from lands where tuberculosis is still rife but the organisation is insufficiently developed to make scientifically planned studies of tuberculosis possible.

It seems increasingly important that the diminishing material at our disposal in England shall be studied to the best possible advantage, thus providing education and advancement of knowledge not only for English doctors but also for those from many different parts of the world.

Reorganisation

The incidence of tuberculosis in children has diminished so much that it has become unsatisfactory to attempt to provide residential treatment at a local level of organisation. Only if cases are drawn from a population running into millions is it possible to concentrate a sufficient number of the many different types, at different ages, to provide a balanced material on which appropriate methods of treatment can be studied. Much disservice will be done both to the study of tuberculosis in young people and to the children themselves if, now that empty beds are appearing in pædiatric and tuberculosis accommodation throughout the country, patients are treated in a large number of small groups, a few here and a few there. Without a large material, advances based on a knowledge of the development of tuberculosis in different types of case, together with adequate statistical assessment, become impossible.

Not only future scientific knowledge but also the immediate needs of our young patients must be considered. Relatively few children with tuberculosis need admission to hospital or sanatorium, but those that do deserve first-class treatment combined with continued suitable education. In any such group of tuberculous children there will be both boys and girls of various ages from infancy up to 16 years. These children will be at different educational levels. Only by a concentration of cases in a small number of centres, each dealing with a sufficiently large number of children, is it possible to mobilise all the educational requirements for their varying needs. Institutional treatment, therefore, should be organised on no less a scale than regional level, and in some instances it may be found wise for regions to combine for this purpose. The number of beds needed will of course vary in different areas, but experience in my hospital during recent years, where virtually all children who are considered to require prolonged institutional treatment are concentrated from the whole of the North East Metropolitan Region and where cases are also sent from other regions, indicates that about 30 or 40 beds will be required per million population.

There are varied reasons, as has been indicated, for the concentration of tuberculous children in sufficient numbers to enable suitable medical teaching to be given to undergraduates and postgraduates. Only with a large material can we hope to provide answers to the many as yet unsolved problems of tuberculosis in children. Who can say that fundamental knowledge about tuberculosis in man generally is not to be obtained by studying tuberculosis in young people? Serious tuberculosis requiring prolonged institutional treatment is now rare in children in this country. This is another important reason for not treating such children in small groups scattered throughout the country but for concentrating them in such a way that both their medical treatment and their education can be adequately provided. In addition to the spread of ages in both sexes, the particular problem of the boy or the girl of grammar-school standard who has contracted tuberculosis should not be neglected. Experience at High Wood has shown that, where these children are catered for from a sufficiently large area, their education can be continued with the minimum of interruption up to the standard of the general certificate of education and beyond.

Tuberculosis hospitals have always been difficult to staff, and where children alone are treated these staffing problems are considerably increased. Difficulties are experienced not only with nurses but also in attracting keen young doctors to undertake work at registrar level. Work among children alone has generally been considered possibly quite wrongly, to be too narrow a field in which to study. There is a similar critical difficulty in obtaining medical auxiliaries for the departments of radiography, pathology, physiotherapy, &c. Usually the only hospitals not affected by these chronic staff shortages are the teaching hospitals; and only a teaching hospital can provide the degree of skill and knowledge required if necessary research is to proceed. If progress is to be made in England with the study of tuberculosis in young people, it is vital for reorganisation to be undertaken in the closest association with appropriate teaching hospitals. It may be considered that the special study of tuberculosis in childhood is more particularly the concern of postgraduates than of undergraduates. Where a postgraduate institution is available to serve a region or combination of regions the plan should be based on it. Probably in most areas, however, a teaching hospital for undergraduates will prove to be the most suitable focal point. Concentration of tuberculous children at a few regional centres in close association with a teaching hospital would provide facilities for potential chest physicians and pædiatricians to undergo a suitable period of training in this special branch.

A regional centre for tuberculous children may be part of the pædiatric service or it may more suitably elsewhere be a special branch of thoracic medicine. Those pædiatricians or chest physicians with most interest in tuberculous children will prove to be the most suitable persons to undertake this work. Clearly, in any event, there should be a close association between these two branches of medicine for this particular purpose.

Conclusion

Further study of the development of tuberculosis in young people is important in relation to the development of tuberculosis in adults, and because of the continuing necessity of teaching undergraduates and postgraduates of many different countries. Though tuberculosis may soon come to be of little numerical importance in England, for many years to come it will remain a great problem

throughout the British Commonwealth and many other parts of the world.

To provide proper treatment for the decreasing number of tuberculous children and facilities for research, centres should be set up throughout the country to cover the needs of large populations. Such centres can be properly organised and staffed only if they are run in conjunction with teaching hospitals for either undergraduates or postgraduates.

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MEDICAL RESEARCH COUNCIL

IN the new report [1] we are again given selected aspects of medical research, with the council's own contributions placed against the historical and global background. There are also summaries of the work of the council's numerous establishments, references to their publications, and sections on personnel, administration, and finance.

If medical research is likened to a tangled tree, this report may be said to display, very plainly, some of the growing-points and buds. Most of its ten sections are models of what such writing should be—authoritative, succinct, clear, and interesting both to the general reader and the specialist in other branches.

Control of Poliomyelitis

The poliomyelitis section naturally centres round the introduction of the Salk vaccine. It refers to the critical part of the American trial as "a classic example of the right way to conduct such investigations," and concludes that "there is no reasonable doubt that the vaccine had reduced paralytic poliomyelitis, in the age group tested, to just over a quarter (28 per cent.) of what it would otherwise have been." (Attention is drawn, however, to the lack of any evidence, so far, on the effect of the vaccine on children under 6 years old.) The unhappy sequel is told in a brief and sober paragraph:

"Less than three weeks after the announcement of the results of the American trial, it became known that certain batches of vaccine from one American laboratory, though they had passed the safety tests, were producing poliomyelitis. Altogether, 204 cases, 77 per cent. paralytic and 11 fatal, were associated with these batches; and a smaller group of cases may have been associated with vaccine from another an laboratory. All vaccination was therefore stopped, pending investigation and reconsideration of the safety requirements."

After stringent precautions had been taken to prevent a repetition of this accident in Britain, the council initiated trials (which are still in progress) with a British-made formolised vaccine.

There is much interesting information on the epidemiology of poliomyelitis in this country. A point not perhaps generally appreciated is that tonsillectomy increases the risk of bulbar involvement not merely in the postoperative period but for years afterwards.

Influenza

The behaviour of the influenza virus continues to furnish surprises. Among other things, it has been shown that

"when two different strains of influenza virus enter the host cell, certain 'recombinant' strains emerge with properties derived from both the parent strains. . . . More recent investigations indicate that the process of reduplication does not consist simply in division of the virus but is one in which the host cell itself is intimately concerned. . . . The filamentous forms of virus that are seen under certain conditions appear . . . to be extensions of the cytoplasm of the host cell; but whether this is so is still uncertain. . . . Conversely, in the course of development and reproduction of a virus, certain material derived from the virus may pass to the host."

Speaking of recent progress in the epidemiology of influenza, the report says:

"The evidence . . . is not that the virus dies out after an epidemic and has to be re-imported (as is the case with smallpox in Britain), but that it persists endemically and gives rise to occasional sporadic cases, as do many other infections. The epidemiology of the disease, however, includes another phenomenon, namely, that at times new strains spread across continents, apparently sweeping away older strains as they do so."

Hindrances to the introduction of effective influenza vaccines include the difficulty of predicting an epidemic, and its causative type or strain; diagnostic and other complications due to A.P.C. viruses, common-cold viruses, and possibly other viruses; and uncertainty on whether polyvalent or specific monovalent vaccines should be used. This last question is at present the subject of a comparative trial by the council.

Vaccination against Tuberculosis

After a historical review, the council's big trial of B.C.G. and vole-bacillus vaccines, initiated in 1950 under the direction of Dr. P. D'Arcy Hart, is described. The figures relating to the first two and a half years' follow-up of the 55,000 adolescents in the trial merit quotation. The incidence of tuberculosis was:

1·94 per 1000 in unvaccinated controls, tuberculin-negative at the start of the trial.
0·37 per 1000 in B.C.G.-vaccinated tuberculin-negative.
0·44 per 1000 in vole-bacillus-vaccinated tuberculin-negative.
1·45 per 1000 in unvaccinated tuberculin-positive.

"The broad result of the investigation," says the report, "is to indicate that B.C.G. vaccination of all those eligible would have reduced, by at least one-half, the expected number of cases of tuberculosis developing between 14 and 17 years of age in the whole population group involved." The difference between the results with B.C.G. and with vole-bacillus vaccines is not considered significant.

Fallacies in the Design of Industrial Work

The report demolishes, among others, the Fallacy that Perceptual Tasks are Easy—in other words, "that it is less tiring, for example, to inspect finished articles on a conveyor belt than to take an active part in their manufacture." A review of the evidence leads to the conclusion that "it is easier to produce a fall in efficiency with inspection-like tasks than with light muscular work." Tactfully, the identity of those who upheld this fallacy —which surely runs counter to all human experience— is not given.

More unexpected, perhaps, is the rebuttal of the Fallacy of an Unchanging Optimum in Working Conditions. It has been found that "performance *immediately after* a change of conditions is substantially better than it becomes later on when the new conditions have become stabilised," and "anecdotal evidence from industry supports the view, derived from laboratory studies, that slight and repeated changes in working conditions are often better than steady and uniform exposure to some supposed ideal or optimal conditions."

Prevention and Treatment of Industrial Injuries

Accident-proneness is analysed into *perceptual* (which is failure to appreciate the presence of danger, commoner in the young) and *motor* (which is failure to react promptly enough, commoner in older persons). Therefore "two forms of preventive action can be suggested. For the younger workers . . . training in safe methods should help to correct perceptual failure, while for older workers the selection, wherever possible, of occupations in which rapid movement is not required would seem worthy of consideration."

Dr. R. E. O. Williams has shown the importance of "silent" infection, often introduced when the wound is

1. Report of the Medical Research Council for the year 1954-55. Cmd. 9787. H.M. Stationery Office. Pp. 286. 10*s*.

dressed, in delaying recovery from minor industrial mishaps. A "no touch" technique is advocated for dressing wounds, while various forms of occlusive dressing are under investigation.

Other Subjects

Of the other sections, those on Antibody Immunity and the Causes and Control of Œdema in Renal Disease are notable examples of condensation and clarity. That on Developments in Biophysics starts by saying that "biophysics is a comparatively young subject which has links with many aspects of biology, biochemistry and medicine. Its peculiar characteristic is the application of physical methods and ideas to biological problems." These remarks are illustrated by a series of glimpses of its astonishingly wide field of activity.

Finally, any doubt that the nation is getting its money's worth from the £2 million or so expended during the year should be dispelled by even a glance at the summaries of work carried out under the council's auspices, and by the 81-page list of publications by members of the council's staff, ranging from Suspended Animation in Cooled, Supercooled, and Frozen Rats to Studies on Expenditure of Energy and Consumption of Food by Miners and Clerks, Fife, Scotland, 1952.

Medicine and the Law

Voluntary Payment or Gift ?

A DOCTOR who was a member of the medical staff of the Hospital of St. Cross at Rugby received £650 in respect of the provisional surrender-value of two life-policies taken out by the board of management of the hospital for his benefit before the inauguration of the National Health Service. The General Commissioners held that that sum was not a payment received by him in virtue of his profession, and accordingly not taxable under schedule D; and the Crown appealed to the Court from their decision.

The following facts were before the Court: Before the National Health Service came into force the Hospital of St. Cross was carried on by voluntary subscriptions from the citizens of Rugby. In 1937 the board of management adopted a scheme designed to give recognition to the professional services given voluntarily by members of the medical staff; it was not intended as a means of remunerating the members of the staff, but rather as a gesture of appreciation for the work voluntarily undertaken. Under the scheme endowment-policies were taken out in the name of the board of management on the lives of the individual members of the medical staff and the board paid the premiums for each member so insured. The sum assured was to be paid to the insured at the age of 60 or on his death under that age while serving on the staff; and on the resignation of a member, the policy was to be the property of the board, who would pay to the member a percentage of the surrender-value according to the number of years' service. Policies had been taken out for seven members of the staff, none of whom had attained the age of 60 or resigned, and all of whom were still living. By an agreement of Feb. 22, 1947, the members of the medical staff were granted contracts on a salary basis. No premiums were paid by the board in respect of the policies after Dec. 31, 1946. The policies taken out on his life were assigned to the doctor, who found himself bound to take over the policies and thereafter to pay the premiums himself or accept the surrender-value.

Mr. JUSTICE VAISEY said that the problem which arose was familiar, and was exemplified by cricketers' benefits and clergymen's Easter offerings. A voluntary payment to the holder of an office or employment was a profit of the office or employment if it accrued to the holder in virtue of his office or employment, notwithstanding that there might not be any legal obligation to make the payment. If, however, a payment to the holder of an office or employment was in the nature of a personal gift to him, it was not regarded as a payment for services but as a mere present. The crucial test was as to the character in which the recipient took the payment, and if it came to him in virtue of his office or professional vocation, and otherwise than as a mere present, he (his Lordship) thought that it was liable to tax. He could not accept the view that the doctor's services at the hospital were not within the scope of his profession, and in all the circumstances his decision must be for the Crown, and the appeal would be allowed.

Temperley (Inspector of Taxes) *v.* Smith—*Chancery Division*: July 4, 1956. J. E. S. Simon, Q.C., and Sir Reginald Hills (Solicitor of Inland Revenue): F. N. Bucher, Q.C., and H. H. Monroe (Hempsons).

IRENE G. R. MOSES
Barrister-at-law.

Public Health

The First Quarter in Scotland

IN the first quarter of this year in Scotland the infant-mortality rate—31 per 1000 registered live births—was the lowest recorded in any first quarter.[1] Neonatal mortality amounted to 20 per 1000 live births, which was 2 below the rate for the first quarter of 1955. The maternal-mortality rate was 0·5 per 1000 live and still births. The death-rate was 15·0 per 1000 population, which was 0·1 below the five-year average. The death-rate from tuberculosis was 21 per 100,000, including 19 per 100,000 from respiratory tuberculosis; these rates are 4 and 3 below those for the first quarter of 1955, and 17 and 15 below the five-year average.

Infectious Diseases in England and Wales

Disease	Week ended June				
	2	9	16	23	30*
Diphtheria	6	4	3	5	8
Dysentery	1370	1381	1246	1519	1466
Encephalitis:					
Infective	3	8	2	6	2
Postinfectious	1	..	2	4	1
Food-poisoning	275	413	225	255	385
Measles, excluding rubella	3839	3187	3388	3224	3740
Meningococcal infection	31	27	23	29	21
Ophthalmia neonatorum	24	25	42	48	16
Paratyphoid fever	16	21	17	18	3
Pneumonia, primary or influenzal	442	330	273	248	267
Poliomyelitis:					
Paralytic	38	38	21	38	47
Non-paralytic	21	17	22	25	34
Puerperal pyrexia	216	187	190	197	240
Scarlet fever	492	575	639	661	642
Smallpox	..	..	..	..	..
Tuberculosis:					
Respiratory	685	674	648	706	746
Meninges and C.N.S.	10	19	14	14	12
Other	89	100	86	93	94
Typhoid fever	5	9	2	2	5
Whooping-cough	1813	1929	2159	2165	2372

* Not including late returns.

The World's Statistics.—The sixth of W.H.O.'s annual volumes of epidemiological, vital, and health statistics, covering the year 1953,[2] has now been issued. The interval of two and a half years before publication may seem sadly long, even if some countries are slow in supplying their figures; but epidemiologists and others will gratefully seize on this work as a mine of information that is to be found nowhere else.

Matters of Life and Death,[3] a booklet setting out simply some salient features in the wealth of statistics at the disposal of the General Register Office, has been issued in a second edition.

1. Quarterly Return of the Registrar-General, Scotland: Births, Deaths, and Marriages registered in the quarter ended March 31, 1956. H.M. Stationery Office. Pp. 32. 2*s*. 6*d*.
2. Annual Epidemiological and Vital Statistics, 1953. Geneva: W.H.O. 1956. Obtainable from H.M. Stationery Office, P.O. Box 569, London, S.E.1. Pp. 571. £2 10*s*.
3. General Register Office: Matters of Life and Death. H.M. Stationery Office. Pp. 28. 1*s*.

British Medical Association

Brighton was host to the British Medical Association for its annual meetings this year, under the presidency of Dr. ALEXANDER H. HALL, of Hove. In the much-transformed stables of the Prince Regent at The Dome, the annual representative meeting faced an agenda of 359 items against 296 last year. Among the first was the election of Mr. WELDON P. T. WATTS (Newcastle upon Tyne) as president of the association for 1957–58. The annual representative meeting lasted from July 5 to 9, and Dr. IAN GRANT (Glasgow) was in the chair.

Dr. E. A. GREGG, chairman of council, in his introductory review, said that the joint action of the Joint Consultants Committee and the General Medical Services Committee in presenting a claim for a long-overdue adjustment of remuneration was regarded by the council as a most encouraging example of coöperation between two major sections of the profession. Despite the present economic difficulties of the country, the council made no apology for supporting the demand that the Government should fulfil its obligations to the profession. The Spens Committees were expressly directed to pay due regard to the desirability of maintaining the proper social and economic status of the medical profession; "and," Dr. Gregg declared, "we should be failing in our duty both to ourselves and to posterity if, when the incomes of so many other sections of the community are being adjusted to keep pace with the fall in the value of money, we made no effort to recover the ground that we have lost since our remuneration was adjusted in the light of the Danckwerts award."

There was some suggestion that too much employment was being provided for the elderly in the General Medical Council. Dr. Gregg said it was the representative meeting last year which decided of its own free will to select for the support of the association in the G.M.C. election a number of persons who, whatever their mental agility, could hardly hope to be "seeded" for the centre court at Wimbledon.

Dr. Gregg announced that the association had gratefully accepted an invitation to send six British doctors to Russia in August.

NO SMOKING

Normally at the annual representative meeting the standing order which bans smoking is suspended more or less automatically. This year three speakers opposed the move to do so—Dr. J. O. MCDONAGH (Perth), Dr. R. COVE-SMITH (Marylebone), and Dr. LENNOX JOHNSTON (Wallasey). Although there were some cries of "No" when Dr. McDonagh declared there was a definite relationship between smoking and disease, the three-quarters majority necessary to suspend the order was not obtained. Later efforts to raise the ban were also defeated; but on the second day of the meeting it was announced that work would have to continue into the evening, and this news seemed to tip the balance in the smokers' favour, since a further vote gave them the necessary majority.

DRUGS

Dr. A. BROWN, chairman of the private practice committee, was able to report a sympathetic Ministerial attitude in the matter of allowing private patients to get drugs under the National Health Service. The Minister had gone so far as to suggest talks with his officers. Dr. R. HALE-WHITE (Marylebone) thought the Minister was doing what his predecessors had done—stall. Only he had stalled in a more subtle way. Contrary to what the Minister said, it had nothing to do with remuneration; nor was it a concession but a redemption of a promise. The meeting passed a resolution proposed by Dr. R. GREEN (Brighton and Mid-Sussex) re-emphasising the importance it attached to the principle of allowing private patients to obtain drugs, appliances, and dressings through the National Health Service and urging the council to seek a successful solution to this long-standing grievance.

PUBLIC-HEALTH APPOINTMENTS

Dr. J. B. TILLEY, chairman of the public-health committee, announced that all but eight local authorities had implemented the latest award. Middlesbrough was the only authority which refused to honour the findings of the appeals machinery. The management side of the Whitley Council had tried to persuade them. The association would have to see whether they could not do something stronger to ensure that the individual had what the appeals machinery said was his right. It was hoped that appeals machinery would shortly be available in Northern Ireland. Recently advertisements had appeared which precluded married medical women from applying. Dr. Tilley moved, and the meeting affirmed, that it should be the policy of the association that no woman doctor should be disqualified from obtaining a public medical appointment or be dismissed from such an appointment simply by reason of marriage.

AN EDITOR'S FREEDOM

The meeting considered the policy of the association towards the *British Medical Journal*. Mr. H. H. LANGSTON (Winchester) proposed that the council should be instructed to take steps to ensure that leading articles in the journal reflected the association's policy. But the meeting was not happy about this suggestion, and fears were expressed that it would seriously limit the editor's freedom. Dr. B. HIRSH (Manchester) said it would be tragic if the editor had to ask the association for a policy before writing an article—if only because it was not certain that the B.M.A. always had a policy. Dr. Hale-White interpreted the motion as an attack on the editor, whom he knew was held in the highest esteem. "If the editor does not please, get another. Don't hedge him round with controls." The meeting agreed that such restrictions would be undesirable.

AIR POLLUTION

Dr. D. S. ROBERTSON (Edinburgh) thought that names such as "Auld Reekie" should be looked on as badges of shame. Mortality from chronic bronchitis in Brighton was 29 per 10,000. In Oldham it was 139—five times as much. Medical opinion was coming round to the view that the cause was atmospheric pollution by smoke. His motion, viewing with grave concern the continued menace to health caused by air pollution, welcoming the Clean Air Bill, and calling for vigorous implementation by the Government and local authorities, was carried.

COMMUNICABLE DISEASES AND IMMIGRANTS

Twenty West Indian immigrants were examined by mass radiography, and two were found to have active tuberculosis. Appointments were made for them to go to the chest clinic, but they disappeared and have not been seen since. This story was told by Dr. J. G. FREEMAN HEAL (Willesden), who asked the meeting to express alarm at the continued influx of immigrants suffering from communicable diseases. In one North-West London clinic, he added, a third of the tuberculosis beds were permanently occupied by Irish immigrants. He suggested that the high morbidity-rate was due in some degree to the introduction of tuberculosis by immigrants. Other communicable disease brought in included venereal diseases and trachoma. Dr. H. GUY DAIN (Birmingham) said it was necessary that the public should understand the prime importance of this matter. He pointed out that any suggestion of pre-entry examination would conflict with Britain's present "open door" policy. The council was instructed to explore the problem and to consider what action was necessary.

HEALTH VISITORS OR HEALTH NURSES?

If health visitors had a severe critic in Dr. A. G. HERON (Bristol), they had many champions. Dr. T. M. GIBSON (Leicestershire and Rutland) and Dr. I. M. JONES (Sunderland) described how they had secured close liaison with health visitors in their practices. Dr. J. S. HAPPEL (Winchester) was only unhappy about the name; he thought "health nurse" was a better one, and the meeting agreed. Dr. A. J. R. F. JOHNSON (East Norfolk) wanted the duties of health visitors combined with those of district nurses in country districts, but this the meeting rejected after Dr. Tilley had declared that dull uniformity in arrangements was not what was wanted.

CONTROL OF NEW DRUGS

Uneasiness about any curtailment of clinical freedom was apparent in the discussion that arose out of a suggestion that the profession would welcome some degree of restraint in the use of new drugs while therapeutic trials were in progress, provided that such trials were supervised by some central body. Dr. I. P. W. SKINNER (Oxford) emphasised that such restraint was very different from a Government ban on drugs. He advocated some such action because of the multiplicity of new drugs. Uncontrolled experiments in general practice or hospitals were unscientific, uneconomic, and of dubious morality. This matter was better mooted by the profession than imposed by Government pressure—a point underlined by Dr. R. W. MCCONNEL (Bucks), who favoured the establishment by the association of a body which would organise trials. The "horrible alternative" was an official list of drugs which could be used. But Dr. G. CORMACK (Newcastle upon Tyne) feared that the Government would get its hands on a controlling body. Aureomycin had not been available in this country for a considerable time after it was in use in others, on the grounds of cost. There was no real way to find out the value of drugs except by widespread clinical trials. Dr. J. S. M. ORD (Glasgow) said that no doctor was going to experiment with his patients or use a new drug until convinced of its therapeutic value. Mr. J. R. NICHOLSON-LAILEY said the subject was being discussed by the science committee, which would not agree to setting up any body that would control the clinical freedom of the doctor. At his suggestion Oxford's motion was referred to council.

THE PROFESSION'S CLAIM

Dr. A. TALBOT ROGERS, chairman of the General Medical Services Committee, said the joint claim was not a bargaining one in which more was asked than was expected in the anticipation that it would be pared down. It was true that if worked out as a global sum it might seem considerable. That was an index of the restraint shown over the years in not asking for what was the doctors' right. The written observations of the Minister were awaited before discussions began, and Dr. Talbot Rogers said that it was the intention to give the profession the fullest information as soon as possible.

Dr. H. M. GOLDING (Bristol) asked representatives to welcome the proposal for a joint approach by the G.M.S. Committee and the Joint Consultants Committee. Dr. R. P. LISTON (Tunbridge Wells) remarked that the profession had at last determined to speak with one voice. The motion was carried without dissent. Dr. H. G. ST. M. REES (West Suffolk) described inflation as a creeping evil when he called for a maximum period of two years between each adjustment of the contract. Dr. Talbot Rogers said that they were trying to secure a periodic review, but it would be unwise to say that this must be every two years.

FILLING PRACTICE VACANCIES

In England and Wales candidates for general-practice vacancies are short-listed by the executive council, the final selection being made by the Medical Practices Committee. In Scotland selection is by the executive council, with the Medical Practices Committee as an appeal committee. East Norfolk wanted the Scottish method adopted in England and Wales, although Dr. J. S. HAPPEL (Winchester), speaking from experience of both, preferred the English system. Dr. Talbot Rogers said that the Department of Health for Scotland, to enable them to fill vacancies in this way, had taken certain powers which could be questioned. The Ministry of Health was not prepared to act under these powers and an amending Act would be necessary. It was the time factor which had worried most people about the English system, and discussions were in hand with the Ministry with a view to speeding up the procedure.

ADMISSION TO THE OBSTETRIC LIST

The younger and older members of the profession disagreed about the qualification for admission to the obstetric list. Marylebone asked the meeting to reiterate its resolution of 1955 that, in view of the wide variation in different executive-council areas in the criteria for admission to the list, any duly qualified registered medical practitioner should be placed on it without further question. Miss GLADYS SANDES declared that a properly trained practitioner should be allowed to do obstetrics if he wished. But Dr. ROY WEBB (East Suffolk) said that the average newly qualified general practitioner was not capable of dealing with emergencies. The general-practitioner obstetrician should be prepared to give plasma-transfusion and should be more experienced in antenatal care. There were interruptions when he added that the present standards in general-practitioner midwifery were all too low.

Dr. L. I. FREEMAN (St. Pancras) also opposed the motion. From the national point of view the practice of expert midwifery would improve the health of mothers and babies. The association was pledged to encourage improved standards of practice, and the Royal College of Obstetricians and Gynæcologists had tried hard to raise the standard of obstetrics; this motion would defeat that object. (Cries of "why?") Dr. A. R. FRENCH (Marylebone) said that Parliament had given to the General Medical Council the duty of determining the standard of training in medicine, surgery, and obstetrics. Why should any body of men, sitting in a local area, have the right to say that the standards laid down by the G.M.C. were wrong? The (Marylebone) motion was carried.

ADVANCE PAYMENT OF COMPENSATION

The chairman of the compensation and superannuation committee, Dr. A. N. MATHIAS, said that the question of repayment of compensation, the low rate of interest, and the narrow definition of hardship, on the grounds on which early payment could be made, had been considered. In the past the association had met with a blank refusal. The preparation of a special case for personal consideration by the Minister had been delayed by work on the betterment claim but was now proceeding. In equity the case was a cast-iron one. Dr. Cormack emphasised the need for an adjustment of the capital value in view of the steady depreciation of the currency since 1948. If the matter was allowed to slide those who had been deprived or defrauded of their money might well find that when they came to get their share it would not be enough to buy a stick to brandish at the politicians. It was a compulsory loan to the Government at a low rate of interest. Dr. O. C. CARTER (Bournemouth) said that he joined the National Health Service in 1948 and resigned after two days. He got his compensation—and by judicious investment it had now doubled itself. The meeting instructed council to press for payment of compensation, adjusted to take into account the fall in the purchasing price of the pound, and, until such time as full payment of compensation

was made, for the rate of interest to be raised to current levels.

Dr. LESLIE W. JONES (North-West Wales) referred to the drawing of compensation money in cases of hardship. Dr. Mathias promised that if the committee failed in other respects in its claim, it would press for a broadening of the definition of hardship.

POLIOMYELITIS VACCINATION

A motion deprecating the action of the Minister of Health in making important medical announcements to the general public before informing the medical profession was tabled by West Denbigh and Flint. Dr. ENID HUGHES declared that such unethical behaviour on the part of the Minister was ultimately against the interests of the patient. She spoke of the Minister's ill-starred appearance as an expert on poliomyelitis vaccine. It was the sort of thing which destroyed public confidence in the National Health Service and which reacted strongly against the Minister himself. Dr. Talbot Rogers thought the protests which had appeared in the medical press and the personal representations which had been made would have their effect. The G.M.S. Committee had been told that the whole scheme could not have been delayed. They felt that the time taken in preparing the scheme had been badly used and that there should have been an earlier notification to the profession.

ECONOMY IN PRESCRIBING

Dr. R. S. V. MARSHALL (South Staffordshire) proposed that in order to let practitioners know more about the cost of drugs, random selections of E.C.10 forms should be returned after pricing to the doctor who issued them. Dr. Talbot Rogers thought that this could be a useful new idea and it was referred to council.

Dr. ALAN REZLER (City) said that though not many doctors had so far had money deducted because their prescribing costs were above the average, a great many more had been investigated and intimidated in order to force the profession to "toe the party line." If there must be standard prescribing, was it not necessary to go the whole hog and have the standardised doctor? Because the average prescription cost in Scotland had been about a shilling more than in England and Wales, was it right to suggest that the Scots were just throwing money around? Dr. Hirsh took another view and suggested a bonus for those whose prescribing costs were below average. Dr. FRANK GRAY said that a doctor was not penalised because his cost was above the average: cases might be picked out for investigation; but would one pick out for investigation the ones whose cost was below average? (Cries of "why not?") City's motion, declaring that the present method would result in a progressive deterioration in therapeutics, was defeated.

ANONYMITY IN BROADCASTING

"Strong pressure" had been brought to bear on the central ethical committee to reconsider the anonymity rule in broadcasting, Dr. ROBERT FORBES, its chairman, told the meeting. The committee had again concluded that any relaxation might be used by some doctors as an excuse to do things which they knew to be unethical and wrong. The council had asked the committee to consider whether a member of the staff of the association or a prominent member of the profession might be named when speaking on a matter of national importance. The committee was loth to accept the view, but went so far as to agree that there might be exceptional circumstances when a departure from the anonymity rule was justified—for example, when a practitioner broadcast in an official capacity on medico-political matters. Dr. C. P. WALLACE (Guildford) congratulated Dr. Forbes and his committee—on moving forward one inch. Nothing could be worse than that the public should be conditioned to receive their education on medical matters from anonymous sources.

Mr. J. C. GIBSON MOORE (Hendon) moved as an amendment that the policy of the association should be as affirmed in 1951—that doctors in sound or vision programmes should insist on anonymity. If practitioners were allowed to give their names there would be jockeying for position at the B.B.C. Dr. Liston asked whether the man in the street minded who talked to him on the radio so long as it was a doctor? Dr. S. NOY SCOTT wanted no departure from absolute anonymity, but Dr. Gray pointed out that the council itself deliberately broke the rule in asking Lord Horder to broadcast on the diet sheets which the B.B.C. had proposed to put out. Would that talk have had the same force if it had not been by Lord Horder? The amendment was carried.

S.H.M.O.S

Senior hospital medical officers (S.H.M.O.S) featured large in the discussions on hospital and consultant services. The chairman of the Central Consultants and Specialists Committee, Mr. T. HOLMES SELLORS, said his committee was extremely disquieted at the plight of many S.H.M.O.S. Mr. J. C. MCMASTER (West Somerset), speaking for what he called this substantial minority, criticised the hole-and-corner methods of reviewing committees; it was one of the most disgraceful episodes of the National Health Service. Dr. F. E. GRAHAM-BONNALIE (Exeter) said that the remuneration should at least be brought up to that of general practitioners. The meeting passed West Somerset's amendment that a review of S.H.M.O.S was overdue and should be undertaken by a newly constituted central committee. It accepted another amendment from Reading that no further posts should be established and the present ones be subject to biennial review.

DISTINCTION AWARDS

Mr. JOHN DUNBAR (Glasgow) declared that at least 90% of consultants were dissatisfied with the merit-award scheme whereby a cabal made secret inquiries. Prof. P. C. P. CLOAKE (Birmingham) and Mr. Langston both emphasised the danger of interfering with a part of Spens, but the representative body asked the council to consider the desirability of abolishing the merit-award scheme, except in very exceptional cases, and replacing it by a system allowing for responsibility payments.

DOMICILIARY VISITS

Dr. J. S. ROSS (East Herts) asked that the association should press for the payment of domiciliary consultation fees to whole-time consultants without restriction. Dr. J. A. RIDDLE (Dartford) explained that the whole-time consultant would be doing his visit in the time when, if he was part-time, he could be doing his private practice. Despite a warning from Mr. Holmes Sellors that their action was unlikely to have effect, the meeting deplored the differentiation between domiciliary visits carried out by whole-time and part-time consultants.

COMBINED POSTS IN DERMATOLOGY AND VENEREOLOGY

Dorset wanted the council to reconsider its decision not to accept for the *British Medical Journal* advertisements for combined appointments in dermatology and venereology. Dr. A. G. CHAMBERLAIN foresaw that there would not be enough work for venereologists now that antibiotics had changed the situation. Dr. K. M. TOMLINSON (Gloucestershire), opposing this as a member of the dermatologists group, said he understood that venereologists were anxious to get posts covering wider areas. The motion was defeated.

PREREGISTRATION YEAR

Dr. Heron thought that it would be advantageous both to the future general practitioner and the future

consultant if he spent part of his preregistration period in general practice, and practitioners should be allowed to do so. Dr. F. M. ROSE, however, felt that it was essential that the period should be spent in hospital. The motion was lost. So was another Bristol suggestion, moved by Dr. PERCY PHILLIPS, that posts in mental hospitals should be included among approved house-appointments.

REMUNERATION POLICY

The meeting passed a series of resolutions moved by the chairman of the committee on remuneration policy. These reaffirmed that medical men and women should be remunerated as doctors, and that their remuneration should not be determined by relation to that of lay personnel in the same sphere; that where in any particular sphere of practice the levels of remuneration were such as to constitute a deterrent to recruitment, the association should take steps to promote or support negotiations for improvement; that the Spens reports should be maintained as the basis of professional remuneration; and that the Government should be urged to set up forthwith a committee of inquiry to consider what should be the range of remuneration of public-health doctors. Dr. J. G. M. HAMILTON said that the public-health service needed to be looked at "from the ground up." The result of the present position was a decline in the quality of entrants to the service. Dr. Tilley, chairman of the public-health committee, welcomed this affirmation of the profession that it would stand together.

The meeting also accepted a recommendation that the association should develop a policy whereby the council would come to assume fuller responsibility for all future claims submitted by any section of the profession.

CODE OF CONDUCT FOR PATIENTS

The council was criticised for its decision to discontinue consideration of a code of conduct for patients. Dr. M. R. SHERIDAN (North Middlesex) asked that the matter be pursued further. A code of conduct, he declared, was essential to the efficiency of the service. While most patients were coöperative, a few could be a deplorable nuisance. But Dr. Wallace said that all doctors had been insulted by patients—and he hoped they had all forgiven them. The only thing which mattered was the doctor-patient relationship, and that relationship must be one as between friends. Having turned down Dr. Sheridan's suggestion, the meeting was asked by Manchester to say that in view of the fact that penalties are inflicted on doctors for infraction of their terms of service, there should be some similar penalty for patients. Dr. Hirsh said that it was the function of the B.M.A. to protect the doctor: in the past it appeared to have been largely concerned with protecting patients against practitioners. There was nothing to prevent a patient phoning for a doctor fifty times a day or fetching him out unnecessarily at night. Dr. B. RAEBURN (Manchester) remarked that the difficulty was that doctors were under contract to a Ministry, while patients were not. But he suggested that a complainant should be required to deposit £2 with the executive council, which would be refunded only if a complaint was substantiated. Dr. A. C. RUSSELL observed that so long as the patient was the person who could swing votes, no party would propose that patients should be punished; but Dr. Raeburn's idea might well be considered. The Manchester motion was carried.

RETIREMENT OF DR. GREGG

At the end of the meeting the chairman announced that Dr. Gregg had indicated that he did not wish to stand for re-election as chairman of the council. Dr. Grant referred to Dr. Gregg as one of the outstanding personalities of the association; and representatives gave the retiring chairman an ovation.

A NOTABLE ANNIVERSARY

The representative body paid tribute to Mr. HARRY COOPER on his 50th year of attendance at annual meetings of the association as reporter for the *British Medical Journal*. Dr. Hamilton, chairman of the journal committee, said that throughout the half-century Mr. Cooper's work had been distinguished by the clarity, effectiveness, and economy of his reporting.

SOME OTHER SUBJECTS

A motion asking the Government to arrange courses on the medical implications of modern warfare which could be attended by any interested medical practitioner was referred to council.

Dr. Rose championed the house-officers, and Preston's motion calling on council to press for substantial increases in remuneration was carried.

Mr. Nicholson-Lailey criticised the Government's action over white bread—action taken against the advice of the M.R.C. committee. The public would be getting an inferior quality at an increased cost.

A count was necessary on a motion from Oxford that the National Health Service should not be available to foreigners on holiday, except nationals of countries with which there were reciprocal arrangements. It was defeated by 155 votes to 135.

Dr. French described as astonishing the refusal of the Home Secretary to legalise the administration of morphine by competent nurses in serious industrial accidents, despite joint representations by the Royal College of Nursing and the B.M.A. The meeting agreed that further action should be taken.

Dr. A. M. MAIDEN (Lincoln) drew attention to the yearly 200 cases of tetanus and the 80 deaths. Anti-tetanus serum had its dangers, and Dr. Maiden persuaded the meeting to urge the Ministry of Health to encourage active immunisation as a public-health measure.

THE SCIENTIFIC EXHIBITION

The scientific exhibition is now an established feature of B.M.A. annual meetings. This year the "local" hospital, the Royal Sussex County Hospital, illustrated the results in early operable carcinoma of the breast (stages I and II) treated by radiotherapy alone. A report by Dr. JAN DE WINTER noted that besides saving the patient physical mutilation and mental trauma, this treatment limited her stay in hospital to the two days required for biopsy-excision of the tumour mass. It remained to be seen whether the early promising results would be maintained. An exhibit from the University of Glasgow illustrated the method used in Prof. C. F. W. ILLINGWORTH's department to destroy the pituitary gland in the treatment of advanced breast cancer. In the original report [1] it was suggested that the use of a less penetrating isotope than radon, such as yttrium 90, might be an advance, and a case treated in this way was demonstrated. Mr. W. P. GREENING and his colleagues at the Royal Marsden Hospital showed how they used radioactive gold for the same purpose.[2]

The Royal Eye Unit, Lambeth Hospital, and the Annie McCall Hospital, of the Lambeth group, displayed the use of the aminated derivatives of phenothiazine for sedation in ophthalmic surgery and in obstetrics. Panels showed the results in 500 deliveries in which promethazine and pethidine were used, compared with a control series in which pethidine alone was given. Included were the comments of patients and midwives—the obstetricians have not yet given their views. The midwives reported that when promethazine was given as well the first stage was shortened, the pethidine acted more quickly, and the patient was surprisingly fresh after delivery.

Three stands were devoted to investigations conducted in general practice. Dr. GUY DAYNES gave a striking demonstration of two common gluten-induced syndromes, with practical details of the management of the gluten-free diet. The South-East England Faculty of the College of General Practitioners showed what the college had been doing in the way of epidemiological research, particularly into the spread of "winter vomiting disease." And Dr. I. H. J. BOURNE's exhibit concerned two methods by which a limb may be held quite still in the optimum position while plaster-of-paris splints are applied.

1. Forrest, A. P. M., Peebles Brown, D. A., Morris, S. R., Illingworth, C. F. W. *Lancet*, 1956, i, 399.
2. Greening, W. P. *Ibid*, p. 728.

In England Now

A Running Commentary by Peripatetic Correspondents

I FELT sorry for the cat. Like me it was undergoing its first deep-sea voyage. However, the cat was a passenger, and I, as ship's surgeon, was a servant of the company. Appropriately we began the voyage with the cat in a large wooden cage on the boat-deck while I was two social strata below. During the five weeks of the voyage there were 63 patients with ordinary ailments and 1 who was seriously ill. This last was the cat.

We were careering on an erratic course through the Mediterranean when one of the midshipmen first consulted me about the cat. Midshipmen are the traditional keepers of peripatetic livestock. Certainly the cat appeared to be extraordinarily listless, though admittedly the boat deck is not an ideal place to camp out in during cold spray-lashed nights. Moreover, the cat had neither eaten nor drunk for several days. For a once budding pædiatrician examination proved no difficulty and word was soon passed from cabin to cabin that the Doc had actually listened with his stethoscope. Clinically the animal presented with the signs of a textbook severe bronchopneumonia and had a temperature of over 103°F, with a pulse-rate approaching 200 per minute. It was transferred to the dispensary, where for three days I mopped up the milk cast into the matting by the rolling of the ship. The cat refused to drink until we replaced our powdered milk with the superior condensed variety. Even then tremendous persuasion was needed and dehydration remained a problem for some time. I prepared penicillin, after much thought about the correct dosage. Calculation by age seemed inappropriate, even if we had known what it was, and so a weight formula was devised and a homœopathic amount of the antibiotic was drawn into the syringe. The most difficult part of the procedure was the swabbing of the injection site.

The poor creature was obviously very ill, and visiting was permitted daily at all times for very short periods. The Master warned me that death of the animal would be difficult to explain, would necessitate a great deal of form-filling, and might well run us on to the bureaucratic reefs of the next port health authorities. Gradually I became entrusted with a horrible responsibility. If the cat died no crafty substitution could be made as the ship did not have a cat of its own, owing to a financial risk if the animal deserted on foreign soil. On the second day an angelic-faced midshipman solemnly pronounced the cat to be dead. It was quite stiff, cold, and apparently lifeless. But the heart was still beating and measures to correct the dehydration, combat the infection, and correct the profound psychosis were instituted. Thereafter clinical improvement was noted and the convalescent animal was discharged for the completion of cure to the midshipmen's cabin. This latter is known as the kennel and very soon it smelled strongly of cat.

By the time that we were sweltering in the Red Sea the patient was cured and one morning it was gone. For reasons unknown, responsibility for finding it devolved on me. All over the ship officers and men in impeccable tropical white peered into likely hiding places, while a large shark swam amiably near. From my observations at this time it seemed that a ship is really nothing more than a floating collection of holes. At last I found the cat under the wireless operator's bunk.

As we approached port the cat, who had never really liked me, had the ingratitude to cast large lumps of fur at the sites of injection so that it looked as though the moths had been in its trousers. When we reached Fremantle the animal was replaced in its cage, as though nothing had happened, and was delivered to a little man in feudal fear of some industrial lady whose pet it was. The midshipmen received a tip of 10*s*. After an unwise party the docked ship seemed to be in a typhoon, and I was in no state to hold out my own hand. My reward was that the ship's company agreed that as a ship's surgeon the Doc was a good vet.

* * *

I read with relief Dr. Bourne's heart-murmur similes (*Lancet*, June 30, 1956, p. 1062). At long last they explained the real reason for my lack of skill in matters cardiological. I now realise that this is due not (as I liked to believe) to faulty cochlear construction, nor (as I sometimes discovered) to fluff in my stethoscope tubing, nor yet (as I often suspected) to straightforward common or garden ignorance. It arose simply and solely from my practice of travelling between lodgings and medical school by bus instead of by train.

It is to be hoped that examiners will now take into sympathetic consideration this and similar handicaps which unfairly affect a candidate's chances of success. For example, failure to recognise a raw beef tongue might well be due only to lifelong vegetarianism; and a determination to exclude all atherogenic foodstuffs could easily result in inaccurate descriptions, such as "bread-and-margarine pericarditis."

* * *

I have stopped smoking cigarettes. How smug I am. Nobody dislikes me more than me too. There are no compensations. My singing voice has improved, but then I could not sing a note in key before, so that the only effect of this is that my bathroom voice penetrates more piercingly into the privacy of my musically minded family.

My breathing also is freer. Great lumps of lovely fresh air sweep down into alveoli that have been smoke-filled for years. So, also, do large dollops of the Metropolitan atmospheric cocktail of diesel oil and smog.

My squash-rackets has improved of course, but I am too old to be still playing the game and the extra effort that I can now put into it must be taxing my coronaries to the limit, and no doubt very shortly to beyond the limit, of their endurance.

Appreciation of good food and wine is a long-forgotten and now renewed delight; particularly to my tailor who has done all that safety and decency permits in the way of letting out, and now with undisguised enthusiasm is embarking on a new sartorial building programme.

Actually, this stopping of cigarettes has not been too bad; I have taken the edge off the misery by an occasional cigar. Being inexperienced, I am not always inspired in my selection, and if during one of the inevitable attacks of vertigo which accompany an unfortunate choice I should fall under a bus, I do hope I live long enough to laugh at the clever way in which I have avoided a lung tumour.

* * *

The great joy of not belonging to the Br*t*sh M*d*c*l *ss*c**t**n is that each year you receive a delightful letter from the secretary. It is quite the nicest letter of the year. He sets out in immaculate English, with wit and charm and unerring logic, the advantages of joining. My first reaction is always: "What a fool I am, not to have joined." Out comes my pen and I start to fill in the banker's order. But then I have second thoughts: "If I sign now, then there will be no letter next year. One of the minor pleasures of life will have been lost for ever." Once again I have put my pen away and selfishly look foward to next year's letter.

* * *

MCMXXII.—The Drivelwoombe Phial.

DEAR JAN,

I rather think your lad should go into social surgery. He seems a dependable fellow, but his pipe smoking is not quite up to F.F. PATH. standards, and he sometimes wears stiff white collars. Moreover, he is a bit slack about attending our after-lunch tea break, usually turning up late at the other three. I'm afraid I had to reprimand him quite firmly last week since he was indisputably still in the hospital at six minutes past five.

Still, *tempora mutantur et nos mutamur in illis*. In my young days all we had were our fingers, eyes, and noses, and damn good pathologists we were too. Nowadays many of them seem lost without a microscope. Some clinical idiot is even trying to get one of our team to look at a patient in his ward; after what I said to him I don't think he is likely to try that again.

Yours,
PETER.

Letters to the Editor

THE CASUALTY DEPARTMENT

SIR,—Orthopædic surgeons will have read with great interest the papers by Mr. T. G. Lowden and Mr. Patrick Clarkson upon the development of casualty and accident departments; but many will think it strange that no reference is made to the "Memorandum on Accident Services" published by the British Orthopædic Association in 1943. All the important points are succinctly stated in that report which should be read again by all concerned with the problem, for it outlines the scope and the methods involved in its solution. Logically it followed the British Medical Association report of 1935 and the report of the Interdepartmental Committee of 1939 upon the development of fracture services: both of which envisaged the application of the principle that "continuity of treatment and after care until working capacity has been restored, should be applied in the accident departments of hospitals, to the treatment of all injuries."

In so far as Mr. Lowden and Mr. Clarkson emphasise the principles which have dominated the development of orthopædics during the past half-century their papers will command approval. It is, however, strange to find the former stating (June 30, p. 1060) that "orthopædic problems play much less part (in the management of acute injuries) than is generally supposed." Such a view suggests a concept of orthopædics which is totally false. It is no narrow specialty confined to techniques relating to bones and joints. Its whole concern is with the *general* surgery of the locomotor system in the context of the individual patient himself. Its evolution has been based upon fundamental ideas which at long last are being rediscovered by other departments of medicine and surgery. These are the early detection of potential disability whether by malformation, disease, or injury; continuity of treatment from its inception until rehabilitation is complete; and coördinated control of treatment by a team of experts in buildings specially designed and built for the job so that the needs of the patient as a whole may be treated in close coöperation with those in related fields of medicine, surgery, nursing, and the social services. I stress that it is *general surgery* and is as much concerned with the treatment of shock and of skin and soft-tissue damage as is any other more specialised department of surgery such as those dealing with visceral lesions or those of the cerebrum.

Such matters are well stated in the B.O.A. report which includes this: "The surgeon who is competent to deal with visceral injuries of the abdomen, chest, and head is the surgeon who is daily experienced in those regions; equally the surgeon competent to deal with injuries of the locomotor system is the surgeon experienced in this system—that is to say, the orthopædic surgeon." This report also states that "it would be far from ideal to train a new type of surgeon—the traumatic surgeon"; it also agreed that "the problems are solved more readily by the organisation of accident departments in general hospitals than by the foundation of special accident hospitals"; and it was advisable to have a coördination of services as between central and peripheral hospitals. "Casualty departments must be replanned, reorganised, and often rebuilt. There must be a separate organization and even a separate door of entry for accident cases on the one hand, and acute medical and general surgical emergencies on the other." Casualty beds must be available for short-term treatment of some of the "minor" injuries.

I could go on quoting from the excellent B.O.A. report which has been the inspiration for many of us who have had a hand in improving the existing casualty or accident services; often against considerable opposition.

Mr. Clarkson's opinion upon the casualty departments "throughout the country" is gloomy. Certainly there is room for improvement, as there is for all the hospital services that are working in out-of-date buildings. The improvements that have recently been achieved in so many places have often been vitiated by the overwhelming increase in demand which has tended to convert casualty departments into central general-practitioner surgeries. The good doctors do not allow this and the less good are being discouraged. It is in this direction that further improvement in the casualty services can readily be achieved. The general practitioner must be encouraged to return to the care of minor true casualties with greater enthusiasm and efficiency.

The organisation of first-aid posts might be done on a semi-military basis as suggested by Mr. Lowden, but the general-practitioner service of the country already has the possibility of a better system because it is related already to civilian needs. The development of health centres should be along these lines rather than by the provision of elaborate diagnostic and laboratory services. The whole-time nurse experienced in trauma, and the attendance at frequent intervals during the twenty-four hours of general practitioners on a rota system or, where the need occurred, a continuous medical cover, would go far to obtaining an improved casualty service with relief to the main accident departments. Keen men doing this work could be brought into close association with the general hospitals because they would have a greater interest in the aftercare work, which would follow from the greater confidence and respect which they would receive from the hospitals. There would be no need for the waste of time by consultants visiting such places. General-practitioner refresher courses are as much needed as the undergraduate training which, as Mr. Clarkson suggests, has been neglected.

"The comprehensive accident service should embrace the treatment not only of fractures but also of soft tissue injuries, infections of the hand, burns, tendon and nerve injuries and indeed all injuries of the locomotor system" (B.O.A. report). Services along these lines have been developed all over the country by orthopædic surgeons. They have been at their best when carried out in friendly coöperation with colleagues in other fields. But in trauma the orthopædic surgeon's interest is the largest.

Exeter. NORMAN CAPENER.

BURNS AND SCALDS

SIR,—In his letter of June 30 Mr. Lowden claims that I have fallen into two errors. First, I have tried, he says, "to apply the results of studying the severe burns" seen at the Birmingham Accident Hospital to the "more trivial ones seen on the practitioner's rounds." Did he forget, perhaps, that at the same hospital there has been for some ten years a considerable outpatient clinic treating more than 1000 of the less severe thermal injuries every year—injuries ranging from simple erythema to those with a few small blisters, and others with some small areas in which the depth of the skin damage was difficult to assess, but which could not be admitted owing to pressure on the beds? By and large these less severe burns are surely comparable to those which general practitioners see on their rounds or in their surgeries. I am sure Mr. Lowden will concede that so large an experience should have taught my colleagues and myself something about these injuries as well as the more severe ones seen in the wards. It has taught us that the streptococcus-infection risk in the outpatient cases is by no means negligible, although nothing like the 38% referred to by Mr. Lowden (see below); and that treatment by penicillin cream and careful coverage has, for the most part, given satisfactory results; and that

penicillin sensitisation, as in the ward cases referred to by Bull et al.,[1] has been "rare and transient." The conflicting experience of Mr. Lowden and some others that the "risks of sensitisation to topical antibiotics are very real" is disturbing. It makes one wonder whether these effects he has attributed to penicillin may in fact have been due to some other constituent of the creams or ointments he has employed? I can only repeat that in Birmingham, with the particular penicillin cream we have used for ten years, these effects have rarely been seen.

The second error Mr. Lowden finds in my letter (June 2) is that it implies that 38% of the burns "considered suitable for treatment by the housewife or the general practitioner" are likely to become infected with hæmolytic streptococci if they are not treated by penicillin cream. I have re-read my letter carefully to find out how Mr. Lowden could have made such an inference—but in vain. He admits, quite correctly, that the figure, 38%, referred to a group of severe burns (untreated by penicillin) which were observed during the period of a clinical trial. Even in those wards (which are often overcrowded) the risk varies considerably from time to time. We do not know the actual risk of such infection among "obviously superficial" burns treated by the housewife and the general practitioner, but it is probably not one tenth of 38%. I hope not. However small it is, if my own foot was scalded, I should certainly wish that the treatment adopted was such as to ensure the minimum risk of streptococcal infection; and that the scald should not have to be "presented" to a hospital, after some weeks or months, "as a streptococcal wound." All too often I have heard the forceful comment of plastic surgeons on the many "presents" of this kind they receive from general practitioners and general hospitals.

Farnham Royal, Bucks. LEONARD COLEBROOK.

SIR,—Your leading article of May 19 is obviously written with bias and shows lack of experience in the exposure treatment of burns. The sad story of the wife of Mr. Unconvinced, who so ably describes her sufferings during the exposure treatment of the results of being scalded on the foot by only 10 oz. of boiling water, is worthy of note. But Mrs. Unconvinced was 80 years of age and might have suffered the same type of "burn" by many other forms of trauma. Surely, once upon a time, this condition was known as senile gangrene, rather than as a scald or burn; and formerly every effort was directed at keeping such gangrene dry, and nearly always the process proved very painful indeed. At any rate, Mrs. Unconvinced can congratulate herself on having a doctor who eschewed the advice given by yourself: "Superficial burns cleaned and treated soon after the accident should not need prophylactic antibiotics, but if inflammation spreads around the burn within the first few days it is often the work of the hæmolytic streptococcus, and usually responds rapidly to rest and penicillin." Perhaps the doctor acquired his wisdom before the days when the hæmolytic streptococcus and penicillin were invented, and in this way saved his patient from the hazards of old-fashioned moist gangrene. Maybe the baker mentioned by Mr. Unconvinced would have made a quicker recovery without any treatment at all, especially as he was perhaps self-employed and not entitled to any form of workmen's compensation.

You further say: "The exposure method produces a hard coagulum within two or three days, but, as our correspondent makes plain, the pain may be considerable." Manifestly you have never studied burns treatment by exposure, since the absence of pain after the first few hours is strikingly apparent, and pain only occurs regularly in cases where movement is attempted and joints and their neighbourhood are involved. Lives have been saved when between 70% and 85% of the body surface was affected by the burn; and this would have been impossible if the method was painful, since pain over such an area would be beyond the limit of human endurance. This statement will not of course be believed, because it is written in the book that such recovery is impossible. Bagdad must be exceptional or cannot have read the book.

In this country (Iraq) most of these injuries follow the careless handling of paraffin stoves, which are used extensively for cooking and heating, and explosions are common—with devastating damage to those in the immediate neighbourhood. Where the injury is extensive and deep, the best that can be hoped for is early death. This sounds callous; but as yet the ingenuity of man has not devised any method for successfully using the 15% of undamaged skin to cover the ultimate raw area. We should emphasise, however, that in the early stages there is no certain means of estimating the depth of the burn.

Treatment of the initial shock is stereotyped; but in our management of these cases it has become almost a secondary consideration, even with widespread burns. Once over shock, all efforts are devoted to the local condition, in the attempt to expose the whole surface to the air. This means that all eschars showing evidence of entrapped fluid must be punctured and as far as possible removed painlessly. The same treatment is applied to crusts, and the best method of carrying this out is by immersing the burns in dilute solutions of cetrimide ('Cetavlon') at least every second day. The patient helps materially in this by picking off the crusts and eschars himself—a process which seems to satisfy a primordial instinct. The aim is to expose the total area of the burn and its granulations to the air. It is at this stage that encouragement of movement of all joints pays its biggest dividends.

Now there are several points about dry granulations which are worthy of note:

1. They do not heap up or become "proud," as often happens in cases where raw surfaces are covered. Consequently, after healing, florid scars, keloids, and contractures are exceptional.

2. Plasma loss appears to be minimal.

3. Dry granulations discourage bacterial propagation and toxic absorption—as is shown by the notable absence of fever after the first day or two. (We do not undertake bacteriological checks, which could only disturb the equanimity of those who have the responsibility for the care of the patient.)

4. Split skin grafting on dry granulations has a surprising degree of success even when little effort is made to obtain a sterile recipient area.

5. Comparison of the closed and open methods of treatment has convinced us that closure kills those invisible myriads of epithelial islets upon which ultimate healing usually depends.

In this country (Iraq) the first dressing of a burn is often horse manure—another example of the legendary devotion of the Arab to his steed—and since three cases were lost from tetanus, antitetanic serum has become part of the routine first-aid treatment.

This letter is about burns and scalds; but it would seem that if the views and observations recounted are correct, then a new principle in the treatment of the results of superficial trauma is established. Perhaps another eternal verity is disclosed in the case of Iraq more by expediency and simple observation than laboratory and other scientific means. Mr. A. B. Wallace, of Edinburgh, is to be congratulated on his persistence in the exposure treatment; and we suspect that had he the advantages of the climate of this country (dry and hot) there would surely have been few doubters left. It should be easier to create an artificial climate than to create a sterile department with sterile dressings, doctors, and nurses, and one cannot possibly imagine how such sterile

1. Bull, J. P., Jackson, D. M., Lowbury, E. J. C., Topley, E. *Lancet*, 1954, i, 161.

conditions could be maintained in time of war. Moreover, while the saving in hospital costs is immense, the saving of useful lives, and the relief of pain and suffering are beyond any form of computation.

But our greatest asset in Bagdad is our ward sister (Sister Jamila) who had previously spent long years in treating burns by the closed method, and over four years ago changed to exposure—at first with scepticism and later with unbounded enthusiasm. Her management and nursing of these cases deserves superlative praise and gratitude from patients and ourselves alike.

W. E. M. WARDILL
KHALID NAJI
MOHAMMED ALI
Bagdad, Iraq. ABDUL KADER TALIBANI.

AN OUTBREAK OF POLIOMYELITIS

SIR,—The article by Dr. Ritchie Russell and his colleagues in your last issue reflects an attitude towards the management of poliomyelitis which is bound to cause uneasiness amongst orthopædic surgeons because it emphasises the medical management of respiratory insufficiency at the expense of limb and trunk paralysis. Under these circumstances it is not surprising, to use their own words, that "some neglect of paralysed limb muscles may be inevitable." I may be wrong about this, and should be glad to be proved so, but the one case they cite in any detail only reinforces my impression. They say, and I quote in full:

"One girl aged 4 maintained full flexion of both thighs and knees for a week after admission (the thigh flexors had escaped the paresis evident in other lower limb muscles), and yet, with frequent passive movements and stretching manœuvres, this strong tendency to deformity was corrected within 5 days. She was able to walk a few steps with assistance within 4 weeks of the acute illness."

There can be few orthopædic surgeons who will disagree with me that a child with such severe recent spasm and "with paralysis evident in other lower limb muscles" should not have been allowed to stand, let alone walk, within 4 weeks of the acute illness. What was the hurry, and how could the maximum recovery be obtained by so insulting the natural processes of recovery? I admit it is difficult to thwart recovery in very young children, but Dr. Russell and his colleagues seem likely to achieve this. "Vigorous methods of rehabilitation . . . have been used again with success." If the criterion of success be getting patients on their feet and out of hospital in the shortest possible time, then they may well have been successful. But overstrain in the critical early period of recovery has been shown over and over again to prejudice the ultimate level of recovery. With children there is all the time in the world and no reason for precipitate discharge. Even in adults when, for economic or psychological reasons, we allow resumption of activity earlier than we might wish from consideration of the muscle-charts, we do this with our eyes open and with a careful search for signs of deterioration once walking is begun.

The policy outlined in this paper would be justified only if bed shortage and an overwhelming pressure of new cases made it necessary for treatment to be largely restricted to the management of the dramatic complications which threaten life. But is this really the case and does this not leave a legacy of unnecessarily severe paralysis? I make no claim for orthopædic supremacy in treating this disease, but I do assert that, unless orthopædic surgeons take an equal place in the team and provide skilled supervision at every stage of progress from the day of admission instead of being allotted the mere "responsibility for outpatient supervision after discharge," these patients are going to suffer because they will not make the fullest recovery of which they are physiologically capable.

For the authors' general plea for the treatment of poliomyelitis in general hospitals I have nothing but sympathy and support, and I have previously described in your columns [1] how this may be achieved.

London, W.1. DAVID LE VAY.

APPEAL TO TORTOISE-KEEPERS

SIR,—Whereas I have found members of the genus Salmonella in the fæces of almost every recently imported tortoise (*Testudo graeca* and related species), I have as yet found none in a few tortoises which have been in captivity for several years. It may be that at an earlier date the tortoises were imported from an area where they do not harbour Salmonella spp. or that they rid themselves of these organisms in time. Experience with my own flock suggests that the second explanation is true. If any of your readers owns or knows of a tortoise which has been in captivity for at least seven years, I shall be grateful for a specimen of fæces. These are usually hard and inoffensive, and travel well in a small tin or vial. Postage will, of course, be refunded.

Public Health Laboratory,
Musgrove Park Hospital,
Taunton. J. A. BOYCOTT.

TUBERCULIN TESTING OF SCHOOL-CHILDREN

SIR,—Dr. Leader and Dr. Stewart (June 30) have demonstrated the advantages of routine tuberculin testing of school-children as a means of detecting unknown cases of tuberculous infection. This practice has been carried out in this area chiefly in relation to infants in the maternity and child-welfare clinics, and also to school entrants; but routine tuberculin testing at the three school medical examinations has not been performed, although there is no reason to suppose that the yield would be any less at these examinations than at the earlier ones. The particular advantage of tuberculin testing was shown at one school where 30 children were tested and 8 were positive. Of these, 1 was already known to have had a pleural effusion and the other 7 all had active disease for which they were admitted to hospital. In this instance it was not possible to find the source case, but we believe that a cook who had left a few months earlier and died of "pneumonia" was responsible. I agree with Dr. Leader and Dr. Stewart that it is humiliating to discover how much infection can be traced to known cases. If more sputum examinations, or preferably laryngeal swab examinations, were undertaken at the patients' routine visits to the chest clinic, they would probably reveal more low-grade incipient infection in the population than is generally recognised. How otherwise can one explain the finding of the Medical Research Council workers that 40% of adolescents are already tuberculin-positive.

Not all children who are contacts have annual tuberculin testing, and it is probable that, in children who have not received B.C.G. vaccination, annual testing would help to indicate when a case in the family group becomes infectious. The test is performed most quickly and reliably with the Heaf gun. From the epidemiological point of view, it would be of considerable help if a standard method were introduced throughout the country and the findings were passed to the Ministry of Health; for tuberculin testing can reveal, as no other test can, the level of tuberculous disease in the community and is an indication of the success or otherwise of the present tuberculosis control programme. Following up tuberculin-positive children is tedious work because, as tuberculosis becomes less, case-finding is harder and more expensive of time and money; but every method must be exploited to the full if we are ever to rid the community of the disease.

Chest Clinic, Camberwell,
London, S.E.5. KENNETH MARSH.

1. *Lancet*, 1951, i, 901.

GENESIS OF TROPICAL ANÆMIAS

SIR,—We did not, as Dr. Trowell (June 16) implies, put all our iron into one basket! In our preliminary paper (April 14) we specifically stated that the iron-deficiency anæmias of the tropics and subtropics are in all probability the result of a number of different factors, of which we consider the most important are:

1. Increase in dermal losses of iron.
2. Decrease in the absorption of dietary iron, probably below 4%, because of the high phytic-phosphate and low calcium content of the diet. The composition of the diet in Africa and India support this.

It might be expected that the effects of the latter would be to precipitate the iron as insoluble unabsorbable iron phytate. This might be overcome by increasing the amount of dietary iron, thus permitting a surplus to become available after the phytate has combined with its portion. Alternatively increased calcium content of the diet might be expected to combine with excess phytate to form calcium phytate and leave the iron free for absorption.

We also said that there was no deficiency of dietary iron in most of the countries in which we have been working, and that the intake of this substance was as high, or higher, than in Britain or America; in fact, a deficiency of dietary iron is not easy to come by. The important part that dietary iron is playing in the African has been clearly shown by the work of Walker [1 2] and his colleagues in South Africa.

Previously we [3] classified the anæmias of the tropics and subtropics into *at least* the following:

(*a*) Microcytic iron-deficient (two types).
(*b*) Megaloblastic (two types).
(*c*) Hæmolytic splenic (probably a mixed group).
(*d*) Sickle-cell.

We consider that this classification still holds, and that the predominant anæmias that occur in the tropical countries are (*a*) and (*b*), with (*c*) and (*d*) as subsidiary and sometimes important.

All these anæmias have definite hæmatological and other characteristics, and the first two respond to a specific form of treatment. So far as we are aware, anæmias produced by protein deficiency have no such specific characteristics.

The microcytic hypochromic iron-deficient anæmias that we have investigated have generally no gross liver or spleen involvement, and no abnormal deposits of iron or abnormal liver architecture. The main type of anæmia that we have seen in Africa, India, Ceylon, and elsewhere is of this kind. We fully investigated about 90 cases of severe anæmia in India, and more than double this number in various parts of Africa. In the hot damp regions 70–95% of the anæmias were microcytic iron-deficient, and 5–30% megaloblastic; the proportion of megaloblastic was always greater in the higher, drier, and cooler places.

In both, the primary presenting symptom is *anæmia*. The former responds to iron given in adequate doses (gr. 20–40 daily for six to twelve weeks); they do not respond to protein alone. In some cases, even when given adequate iron treatment, these anæmias will "stick" at levels of 8–12 g. hæmoglobin per 100 ml. and 3–4 million red cells. To bring these to normal we have found protein in the form of skimmed milk necessary. The reason for this is probably that the rapid red-cell and hæmoglobin regeneration that follows iron therapy outstrips the protein stores. A smaller group of these anæmias fail to respond fully to iron and protein alone, but do so if given 80–100 µg. of intramuscular vitamin B_{12}, and this in spite of the fact that their serum-B_{12} levels are normal. Perhaps the reason for this is that in these anæmic conditions the serum-B_{12} level must be higher in order to facilitate protein utilisation and metabolism, or for the synthesis of methyl and –SH groups for hæmopoietic purposes. Nor does this type of anæmia appear to be less common in areas where malaria and hookworm have lower incidence. In Assam, in the areas in which we worked, malaria is not now an important problem yet serious anæmias were very prevalent.

The other type of anæmia in these territories is megaloblastic (10%). Its main presenting symptom is similarly *anæmia*, and it is curable by giving the specific anti-megaloblastic substances: it cannot be cured by giving proteins alone.

In both these predominant anæmias of the tropics the total serum-proteins are within normal limits or lower, although the albumin/globulin ratios may be reversed. High gamma-globulin and low albumin, however, occur in a variety of conditions that are not necessarily associated with either liver damage or anæmia. It is well known that both in man and other animals a diet rich in vegetable proteins causes a rise in the gamma-globulin fractions. It is also of interest that the total serum-proteins and the globulin fractions are similar in the microcytic iron-deficient anæmias and in the megaloblastic; one would have expected that in anæmias of such different ætiology there might have been less similarity in the protein pattern. It seems to us, then, that the constancy of the protein pattern in such very different types of anæmia is indicative that protein changes are probably not specific.

We [3] have always said that the tropical anæmias may have multiple deficiencies, and sometimes may need more than one substance for their complete remission. For example, a megaloblastic anæmia may make an initial and expected response to some hæmopoietic substance, but often the red-cell and hæmoglobin regeneration will outstrip the iron stores, and iron must be administered to bring the patients to their normal hæmatological levels. Some iron-deficient anæmias will respond fully and completely to the administration only of oral iron; others, however, as we have stated above may require protein; and still others small supplements of vitamin B_{12} or folic acid.

Of course, we know that protein malnutrition causes liver damage and may be associated with an anæmia; but this is by no means specific in type or constant in occurrence. It may be megaloblastic (rare), or macro-normoblastic, or with high, low, or normal M.C.V., M.C.H., and M.C.H.C. But the presenting symptoms in this condition are not generally those of anæmia, and when anæmia is present it is not usually cured by giving proteins alone. In kwashiorkor,[4–6] the most dramatic of all the protein-deficiency diseases, anæmia is inconstant in appearance and varied in type. Nor was anæmia the presenting symptoms in the malnourished European prisoners-of-war. We have seen very few such cases in the areas which we have investigated. No doubt if we were looking for cases of hepatomegaly and/or splenomegaly, or even ingrowing toe-nails, we should find some of them anæmic; but we believe that anæmia would not be the presenting symptom, would be inconstant and varied, would have no very specific hæmatological or other characteristics, and would not be curable by any particular form of treatment.

We consider, then, that the great majority of the anæmias of the tropics and subtropics fall into one or other of the groups we have outlined above. We think that although proteins may play a part in some of these anæmic conditions it is secondary to more important and primary deficiencies of iron and/or essential hæmopoietic substances. That some of these anæmias require proteins terminally to complete their remissions is not to say they are primarily and specifically protein-deficient anæmias.

Regarding the term "dimorphic" we have always been a little puzzled by it, and are happy to see that Dr. Trowell himself is not satisfied with it. Is the time yet ripe for "polymorphic"? All anæmias are really polymorphic—as indeed are many diseases.

Perhaps we did use the term "dyshæmopoiesis" in too restricted a sense in some of our former papers. We had in

1. Walker, A. R. P., Arvidsson, V. B. *Trans. R. Soc. trop. Med. Hyg.* 1953, **47**, 536.
2. Walker, A. R. P. *Brit. med. J.* 1951, **i**, 819.
3. Foy, H., Kondi, A., Hargreaves, A. *Trans. R. Soc. trop. Med. Hyg.* 1952, **46**, 327.
4. Altmann, A. *S. Afr. J. med. Sci.* 1948, **13**, 91.
5. Adams, E. B. *Brit. med. J.* 1954, **i**, 537.
6. Walt, F., Holman, S., Hendrickse, R. C. *Ibid*, 1956, **i**, 1199.

mind a differentiation between those marrows which have maturation *defects* as shown by the presence of megaloblasts and/or giant stab-cells—as opposed to marrows that have not these cells but merely have abnormal *numbers* of such normal cells as erythroblasts and normoblasts. But we agree with Dr. Trowell that this may be a quibble, and the term should perhaps be widened to include quantitative as well as qualitative marrow defects.

We [3] have said that giant stab-cells are *not* peculiar to pernicious anæmia but occur in a variety of anæmic conditions including iron-deficiency anæmia. Nevertheless we believe that their presence is evidence of maturation upsets in the white-cell line, perhaps connected with lower levels of folic acid and/or vitamin B_{12} in the serum, since they frequently disappear when these substances are given. We have investigated fairly extensively the marrows in these iron-deficient anæmias, and find them to be hypercellular with a great abundance of normoblasts and erythroblasts; giant stab-cells are frequently present. Occasionally there may be signs of nuclear changes in the red-cell precursors which may herald a megaloblastic change.

Dr. Trowell does not take into account the part that intestinal flora may be playing in the genesis of these anæmias both as synthesisers of, and competitors for, essential hæmopoietic substances.[7] Intestinal flora may also be playing a part in the protein picture as well as in the iron one, as we pointed out (April 14). We wonder whether Dr. Trowell has considered this in relation to kwashiorkor?

Turning to Dr. Marcel Roche's most interesting observations (June 16) regarding blood-loss and hookworms. We agree that if the loss is 100–200 ml. daily it is indeed serious, especially if, as he says, this occurs in the most anæmic cases. We can only say that even in those of our cases which had heavy hookworm loads such gross blood-losses certainly did not occur.

All our anæmic cases were chosen at random from people at work. They were all grossly anæmic (2–7 g. Hb per 100 ml.) yet only 30% of them had hookworms, and of these the majority had only light infections (ova found after two or three stool examinations). The hookworm-infected cases had no greater degree of anæmia than the non-infected ones, and often the highest degree of anæmia was found in those who were without parasites and gave no history of them. We had our patients in hospital under our complete control for three to five months, and were thus able to assess the degree and rapidity of response to any particular treatment in all our cases. We found no difference in the rate or magnitude of the response in cases which had no hookworms and those which had. Nor could we find any significant difference in the responses in those who were dewormed before treatment, and those who were dewormed terminally. Many factors, of course, contribute to the rate and degree of response to any specific treatment, and to assess the relative value of all of them would indeed be difficult.

The part that hookworms play in the genesis of these iron-deficient anæmias must remain uncertain until critical studies have been carried out. Our own view is that, although they may play a part, it may not be a paramount one.

We wonder, Sir, whether the term "macrocytic" is not now too broad to be either useful or precise? Macrocytosis occurs at some stage in iron-deficient anæmia, in megaloblastic anæmias, and in the various anæmias of liver disease, &c., &c. Macrocytosis is *not* synonymous with megaloblastosis, since certainly not all macrocytic anæmias are megaloblastic, and megaloblastic anæmias are not always macrocytic. Frequently macrocytosis is not directly correlated with reticulocytosis. The use of the term macrocytosis without qualification and elaboration is misleading and non-specific.

In conclusion, then, we think that the great mass of the anæmias in the tropics and subtropics fall into one of the four groups that we have given above; and although no doubt protein malnutrition is playing its rôle we feel that the primary deficiencies are iron in the hypochromic microcytic anæmias, and vitamin B_{12} or folic acid in the megaloblastic ones. A full report of our India investigations is in the press.

Wellcome Trust Research Laboratories, Nairobi, Kenya, East Africa.

HENRY FOY
ATHENA KONDI.

SIR,—Dr. Trowell asks "why do iron-deficiency anæmias in the tropics rapidly become macrocytic when iron therapy causes a reticulocytosis?"; and he suggests that this may be due to liver damage and protein malnutrition. This phenomenon was frequently observed during an investigation into the incidence and ætiology of nutritional and other anæmias in the Africans of Lagos. The macrocytosis, which is out of proportion to the degree of reticulocytosis, may become apparent very soon after the start of treatment, or may not be noticed until it is realised that the patient is no longer responding in spite of continued treatment with iron. In addition to the macrocytosis some of the patients have shown giant stab-cells, abnormal metamyelocytes and myelocytes, and even megaloblasts in the peripheral blood or marrow. Although less anæmic than before the start of treatment, the blood-picture has become that of a nutritional macrocytic and/or megaloblastic anæmia. In such cases continued treatment with iron is useless and further improvement only follows the use of vitamin B_{12}.

The following case is typical of this form of response and may be of interest.

A Yoruba male, age about 45, was admitted to hospital with a history of increasing weakness and lassitude, dyspnœa on exertion, and finally semi-coma. He was poorly nourished with wasted limbs, shiny atrophic skin showing a generalised "pavement" dermatitis, and extreme pallor. He was not aware of his surroundings but could be roused. There were no other abnormal findings. His temperature was normal.

Blood-picture.—Red cells, 880,000 per c.mm.; Hb 1·6 g. per 100 ml.; colour-index 0·65; mean corpuscular volume 85μ^3 and mean corpuscular hæmoglobin concentration 21·3%. The reticulocyte-count was 2·0%. There were 4400 leucocytes per c.mm., of which 68% were polymorphs. There was no red-cell sickling, and no malaria parasites were found after repeated examinations. The sternal marrow was hypocellular and showed no evidence of activity. The red-cell precursors were normoblastic and no abnormal red or white cells were seen.

Blood-chemistry.—Total serum-protein 6·0 g. per 100 ml. (albumin 2·5 g.). The van den Bergh test was negative and the serum-bilirubin level was 0·3 mg. per 100 ml. Serum-alkaline phosphatase 3·5 King-Armstrong units per 100 ml.; thymol turbidity less than 1 unit.

Stool specimens contained pus and red cells. Ova of ascaris and ankylostoma were present, and also free forms of *Entamœba histolytica*.

A diagnosis of multiple deficiency state complicated by the presence of hookworms and amœbæ was made, there being a secondary normocytic hypochromic anæmia. He was given a high protein diet and treated with iron ('Ferrivenin') and he responded rapidly. When he had recovered sufficiently the parasitic infections were treated.

Four weeks later the blood-picture was: red cells, 2,180,000 per c.mm.; Hb 6·5 g. per 100 ml.; colour-index 1·1; M.C.V. 110μ^3, M.C.H.C. 27·3%, and mean cell diameter 9·1μ. The reticulocyte-count was 6·0%. The marrow now showed active macronormoblastic erythropoiesis, but no megaloblasts, and no abnormal white cells were seen.

There was no further response although he still received iron. After another two weeks the hæmoglobin concentration was still 6·5 g. per 100 ml. and the M.C.V. had risen to 120μ^3. The marrow on this occasion was highly cellular and showed large numbers of intermediate megaloblasts. The treatment with iron was continued and in addition he received 100 μg. of vitamin B_{12} followed by 20 μg. at weekly intervals. There was an immediate secondary reticulocytosis, reaching a maximum of 10·2% after thirteen days. Twenty-five days after the first dose of vitamin B_{12} the blood-count was: red cells, 3,200,000 per c.mm.; Hb 10·2 g. per 100 ml.; colour-index 1·1; M.C.V. 104·6μ^3 and M.C.H.C. 30·4%.

The anæmia in this patient was a sequel of protein malnutrition and chronic blood-loss in the stools. It would seem that the initial rapid response to iron must

7. Castle, W. B. Year Book of Medicine. Chicago, 1954; p. 266.

have exhausted the low reserves of liver hæmopoietic principle with the result that an iron-deficiency anæmia was converted to a nutritional-megaloblastic anæmia. A similar course of events has been observed in patients suffering from long-continued blood-loss either the result of hæmorrhage (from peptic ulcer or intestinal parasites) or hæmolysis (in malaria and sickle-cell anæmia).

In view of cases such as these, and the not uncommon occurrence of nutritional anæmia in patients suffering the burden of chronic blood-loss or the demands of pregnancy, I believe that many of these Nigerians may have minimal reserves of hæmopoietic principle, sufficient to produce normal cells from an inactive marrow, but rapidly exhausted when the marrow is stimulated to greater activity. This may be a direct consequence of protein malnutrition or may be due to the inability of a diseased liver to store the principle.

St. James' Hospital,
London, S.W. 12. C. G. BERRY.

HYPERCALCÆMIA IN INFANCY

SIR,—We were interested to read the stimulating paper by Dr. Forfar and his colleagues (June 23). We do not think, however, that the features listed in their table v as "unlike calciferol effects" invalidate the concept of vitamin D as a causative factor. Although we agree that the vitamin-D intake of these infants may not always seem excessive, many factors, including individual sensitivity, may enhance the effects of vitamin D. Moreover, we have pointed out (June 16) that estimates of intake may be inaccurate, since the stated vitamin-D contents of cereal foods and dried milk represent minimal values.

Forfar and his colleagues give, as an objection to the vitamin-D theory, the absence of significant clinical change on administering calciferol; but in fact one of their two patients lost weight when given calciferol—an effect discounted as "fortuitous." In the renal control of calcium and phosphorus metabolism so many variables (such as the state of kidney function at the time) are involved that we are unable to evaluate the renal response to calciferol from the data given, and we therefore cannot regard this a valid argument.

We agree that the illness may persist for many weeks after withdrawal of calciferol, but it may also persist for many weeks after gross vitamin-D overdosage [1]; and in any case the symptoms of idiopathic hypercalcæmia may depend on such factors as the stores of vitamin D in the body, the individual susceptibility to it, and the extent of the excess calcification in bones and ectopic sites. An analogy can be drawn with the persistence of symptoms of lead poisoning after withdrawal of lead.

Some of the difficulties in interpreting the facts are removed when the difference between the physiological over-effects of moderate hypervitaminosis-D and the toxic effects of gross overdosage are considered.[2]

Moderate overdosage increases calcium and phosphate retention by increasing phosphate absorption from the intestine and possibly also phosphate reabsorption in the tubules,[3] with resultant hypophosphaturia. Gross intoxication results in demineralisation of bone with loss of calcium and phosphorus in the urine.[4] Since high levels of citric acid in the blood and urine are found in many diseases associated with demineralisation of the skeleton,[3] it is not surprising that they are found in gross calciferol poisoning; conversely, one might expect to find low levels when there is increased density of bone, as in idiopathic hypercalcæmia and moderate vitamin-D overdosage. Hence we do not consider that increased retention of phosphate, hypophosphaturia, hypocitræmia, and hypocitruria are necessarily "unlike calciferol effects" nor that the data of Forfar and his colleagues weaken the evidence incriminating vitamin D in this syndrome.

We believe that our associate, Dr. H. G. Morgan, at present in the United States, would concur in these observations.

R. G. MITCHELL
Department of Child Health, University of St. Andrews, Queen's College, Dundee. J. M. STOWERS
J. THOMSON.

1. Frost, J. W., Sunderman, F. W., Leopold, I. S. *Amer. J. med. Sci.* 1947, **214**, 639.
2. Hess, A. F., Lewis, J. M. *J. Amer. med. Ass.* 1928, **91**, 783.
3. Harrison, H. E. *Pediatrics*, 1954, **14**, 285.
4. Albright, F., Reifenstein, E. C. Parathyroid Glands and Metabolic Bone Disease. Baltimore, 1948; p. 130.

SIR,—Your leading article of June 30 says: "we may conclude that infantile hypercalcæmia is a relatively common condition in Britain." We have had a total of two cases in the 236-bed Children's Hospital in Sheffield in the last three years. We have been constantly aware of the condition and always looked for it in children presenting the symptoms which characterise it. It cannot be said, therefore, that in the Sheffield region it is a relatively common condition. Unless it becomes a great deal more common, the odds that a family doctor will see one case in a lifetime are infinitesimal.

The University of Sheffield Department of Child Health, The Children's Hospital, Sheffield, 10. T. COLVER
R. S. ILLINGWORTH.

*** See also Dr. Sinclair's letter (p. 101).—ED. L.

SIMPLIFIED DOSAGE

SIR,—Mr. Blockey in your last issue raises a very important issue. How are we to resolve the confusion which prevails in prescribing? His solution is to make the hospital dispenser, under the guidance of the university department of therapeutics, responsible for instruction given to the sister in charge as to the dose to be administered. But this solution leaves out many hospitals not directly connected with any university and it touches only one aspect of the problem.

In a correspondence in the *British Medical Journal* on a proposal by Prof. W. C. W. Nixon and others that the metric system should be officially adopted, I suggested [1] that the time had come to introduce an International Unit System of prescribing. I pointed out that at present we use units relating to totally different quantities—e.g., units of insulin, penicillin, and vitamins, which are not comparable. The profession has found no difficulty in accepting and using these innovations of unitary standards, and the logical outcome is the adoption of a unitary standard for all medicaments. The task of standardising the units should, I said, be vested in a suitably constituted scientific committee.

"The quantity decided upon for each drug by such a committee would be adopted as the unit for that drug. . . . We have already official dosages; for instance, calomel, the official dose being 1/2 gr. to 3 gr.; the standard unit could be 1 1/2 gr., based presumably upon average body weight. This would be prescribed 'R calomel 1 unit' in the average case, with decimal fractions of a unit for children and multiples of a unit for exceptional cases, according to the desired therapeutic effect."

I said then, and I say again now, that the present multiplicity of measures will sooner or later make a unitary system essential. Moreover, in a unit system, an international standard of dosage becomes feasible. "Certain drugs may require to be standardized in units of weak and concentrated forms, but this should present no difficulty that cannot be surmounted. New drugs may require to be placed in a transitional category before finally deciding the size of the unit."

Since 1953 scores of new drugs have been introduced, and the new graduate is becoming accustomed to prescribe tablets, capsules, drops, ampoules, snuff, &c., &c., and leave to his "maker" the quantity which the patient receives. Clearly there is a case for action by the

1. *Brit. med. J.* 1953, i, 620.

authorities, in association with physiologists and pharmacologists, and the chemists in the employ of the manufacturers, to produce an international unit for prescription. The cost of setting up a body to decide on the quantities in each unit would be an infinitesimal fraction of the expenditure on present-day advertising.

London, W.1. BRUCE WILLIAMSON.

SULPHÆMOGLOBIN AND THE SPLEEN

SIR,—Whitby and Britton remark [1]:

"On the experimental side, Harrop and Waterfield (1930) produced sulphæmoglobinæmia in splenectomized dogs by feeding them with sulphur. This experiment suggests that there may be some alteration in the hæmoglobin molecule as the result of splenectomy which permits a ready combination with sulphur. The idiopathic human disease may be therefore due perhaps to splenic dysfunction."

I have given sulphur in massive doses and a sulphur-rich diet for four weeks to 5 splenectomised patients, whose blood was examined spectroscopically each day. Sulphæmoglobinæmia developed in none. This suggests that the mechanism detected in dogs by Harrop and Waterfield does not operate in man.

Alexandria, Egypt. K. DORRY LOUTFY.

CLEFT PALATE FOLLOWING CORTISONE THERAPY IN EARLY PREGNANCY

SIR,—Mr. Harris and Dr. Ross [2] have made, I think, a most important observation. The modesty of their assumptions is a model of laudable reticence. I believe that the cortisone given to the mother from about the 38th day of her pregnancy and continued during the time the palate should have been fusing was an important factor, if not the main cause, of the cleft palate in the baby.

The photograph of the stillborn baby described by Mr. Harris and Dr. Ross is typical of Veau type-2 cleft palate which is, as they say, a different congenital deformity from the usual cleft palate (i.e., Veau types 1, 3, and 4), which may be associated with hare-lip, and when inherited appears in different families from those in which Veau type 2 occurs. Their photograph shows the typical wide U-shaped gap in the hard palate typical of a Veau type-2 cleft palate. This is so much more difficult to repair than the V-shaped, or slit-like, cleft of a Veau 1, 3, or 4.

The Veau type-2 cleft palate is, as they say, more common in girls, whereas the more usual cleft, Veau 1, 3, or 4, is more common in boys, and in every series large enough to be significant the proportion of males to females is 3 : 2.

As there is such a wide gap in front of the cleft in the Veau 2 I have often wondered whether there was in these patients really a deficiency of soft tissue, whereas in the more usual type I have always been convinced that there was a normal amount of mucosa and muscle which was merely in the wrong position. The position requires altering by a sliding movement towards the midline to free the mucosa and muscle from the displaced bone; and this procedure, if carefully performed, will produce a perfectly satisfactory repair. Complicated methods of repair and "muscle plastic" operations are therefore wrong. The two important phases of the repair must be done precisely:

(1) Thorough mobilisation of soft tissue from the cleft and displaced bone.

(2) Careful suture of the mucosa covering the floor of the nose and also of the mucosa forming the roof of the palate. Two complete layers of suture are required with the muscle of the soft palate brought into contact between them.

Cortisone prevents healing of wounds and causes cleft palate in animals; it might be assumed also that it may prevent fusion in the development of the human fœtus. It would seem, therefore, that, even in cleft palate Veau type 2, there is merely lack of fusion and not really lack of soft tissue in the midline.

Surely it is time that a careful research programme was started in this country to find out the cause and the way to reduce the number of babies born, or stillborn, with congenital deformities. It would seem that such an important and complicated scientific investigation should be under the guidance of the Medical Research Council. The preliminary animal experiments have been carried out. Mr. Harris and Dr. Ross have given a most timely and serious warning. I do hope that adequate notice will be taken of their very important and beautifully written case-report.

Leeds. MICHAEL OLDFIELD.

1. Whitby, L. E. H., Britton, C. J. C. Disorders of the Blood. London, 1953; p. 684.
2. Harris, J. W. S., Ross, I. P. *Lancet*, 1956, i, 1045.

A NEW CLINICAL ENTITY?

SIR,—In your leader of May 26 you suggest that the epidemic simulating poliomyelitis which occurred in Akureyri, Iceland, in 1948 be classified separately from clinically and epidemiologically similar outbreaks in various parts of the world since then. Your reason is that in the Akureyri epidemic the cerebrospinal fluid was abnormal, whereas in other outbreaks, which you classify as group II, it was usually normal. May I remind you that only 5 C.S.F. specimens from Akureyri were examined. The cell-counts were 3, 0, 80, 10, and 0 cells per c.mm. The protein was 50, 80, 59, and 75 mg. per 100 ml. in 4 samples (protein was not determined in 1 case). An increase in cells was thus found in 1 or 2 cases out of 5 and a slight increase in protein was found in the 4 cases examined.

The examination of 3 C.S.F. samples from patients in Reykjavík, ill at the time of the outbreak in Akureyri, revealed moderately raised cell-counts. It was assumed that the sporadic cases in Reykjavík were also Akureyri disease, but this unfortunately could not be proved.

This slight increase in protein and cells hardly justifies putting the Akureyri epidemic in a class separate from the other outbreaks which have been so strikingly similar both clinically and epidemiologically. Besides, abnormalities in the C.S.F. have also been found in certain cases in other outbreaks [1–4] which you classify in group II.

There is reason to believe that some of the lesions responsible for the signs and symptoms in all the outbreaks must have been in the spinal cord. If this is correct, one would expect that slight changes in the composition of the C.S.F. would be found in at least some cases at a certain stage of the infection, particularly in outbreaks of perhaps more than average severity.

You also suggest that this disease might be called "benign myalgic encephalomyelitis." Akureyri disease is benign in the sense that it does not kill, but in some cases it is not at all benign in other respects. Moreover, would it not be better to avoid the word encephalomyelitis until we know that inflammatory lesions are in fact present in the brain and spinal cord? It seems likely that such lesions may be present but so far nobody seems to have had an opportunity to look for them.

Previous authors seem to have hesitated to give this disease a descriptive name because they have felt the name might become unsuitable as knowledge of the nature and location of the morbid process increased.

I think this puzzling disease can hardly be adequately and permanently named until ætiological and anatomical studies have better identified its nature. Such studies would also help to distinguish it from related conditions, if they exist.

Reykjavík, Iceland. BJÖRN SIGURDSSON.

1. White, D. N., Burtch, R. B. *Neurology*, 1954, **4**, 506.
2. Pellew, R. A. A. *Med. J. Aust.* 1951, i, 944.
3. Ramsay, A. M., O'Sullivan, E. *Lancet*, 1956, i, 761.
4. Sumner, D. W. *Ibid*, p. 764.

RADIATION HAZARDS

SIR,—May I join with Dr. Blair Hartley (July 7) in his condemnation of the use in pregnancy of the Thoms method of brim pelvimetry? Unfortunately the method has had a long start, and although in 1946 [1] and on many subsequent occasions I, for one, have pointed out that the method is unnecessary and probably harmful to the fœtus, it is still, I note with sadness, routinely used in many hospitals.

If the obstetrician's object in requesting radiographic pelvimetry is to strengthen his clinical estimate of the cephalo-pelvic relationship, then I believe that the "graph method" of radiographic interpretation,[2] which has now been well tried over ten years, is at least as reliable as any other system, and a great deal simpler than most. It does not require the use of a Thoms brim pelvimetry film, although in some other details it owes much to the work of that pioneer obstetrician.

To pass to broader issues, can something be done to lessen the repetition of radiographic exposures in young people? Again and again patients passing from one hospital to another have these examinations repeated for no very adequate reason. This may mean, for example, an intravenous pyelography with its seven or eight films plus—who knows?—the extra film that ends in the waste bin instead of the patient's folder. Repetition of examinations might be reduced if on the patient's request card the question were asked, when and where the last radiographic examination was made. In this connection, I recall the patient with pulmonary tuberculosis who had previously been through several hospitals. On her admission my house-officer not unnaturally ordered a radiograph of her chest. The following day I casually remarked to the patient that she had probably already had this done on several occasions. I was staggered by her reply. It was simple and direct. "Yes," she said, "this is the 127th X-ray I have had in five years!"

I also feel—although here I may be laying myself open to criticism—that something might be done to lessen the amount of radiation used for individual exposures. Some radiographers seem to be in the habit of producing unnecessarily "dense" pictures; and if the exposure were substantially reduced the result would still be acceptable for most diagnostic purposes, and certainly for pelvimetry. The more stringent use of masking diaphragms might also be considered.

If the recent publicity concerning the genetic hazards of radiation has done nothing else, it will have served a useful purpose by reminding clinicians of the potential dangers of the examinations which they sometimes so light-heartedly request.

The Radcliffe Infirmary, Oxford. J. CHASSAR MOIR.

SIR,—In his letter of June 30 Professor Haldane writes "It is proposed to compare the frequencies of several abnormalities in different areas, in the hope of discovering or disproving a mutagenic effect of radioactive substances in the soil." He then argues that (*a*) even a slight degree of inbreeding may have an important effect on the incidence of abnormalities due to rare recessive genes, and (*b*) inbreeding may be higher in the more radioactive areas of Britain, because they are predominantly rural, whence (*c*) such a survey might well lead to an overestimation of the mutagenic effect of radioactive substances. He concludes that it would be a waste of public money and of the skill of the men and women who undertake it.

This argument is presented in a letter dealing mainly with the recent report [3] of the Medical Research Council on the hazards of nuclear and allied radiations, and may mislead the reader into supposing that a survey was proposed in the report. In fact it was not. I did suggest a survey, however, in a paper [4] presented at the International Conference on the Peaceful Uses of Atomic Energy at Geneva last year; so perhaps I may reply to his letter.

The object of the suggested survey was to obtain, if possible, useful fiducial limits to the mutation-rate-doubling radiation dose in man. I was aware, of course, that an indirect estimate of the mutation-rate of a rare autosomal recessive gene may be seriously biased if there is inbreeding. But this consideration does not arise when estimating by the direct method the mutation-rate of a clear-cut autosomal dominant gene with a gross effect on biological fitness (e.g., epiloia); it arises to only a relatively slight extent when estimating the mutation-rate of a grossly deleterious sex-linked recessive (e.g., hæmophilia). For this reason the survey was to be based on genes in the latter two classes only. Thus Professor Haldane's criticism was met in advance.

New information given in the M.R.C. report, however, makes it necessary to reconsider this suggestion. I had supposed that the genetically effective radiation exposure from all man-made sources amounted to only a few % of that due to natural background radiation.[5] The M.R.C. report now shows that it amounts to at least 25% of the natural background, diagnostic radiology alone contributing at least 22%. Furthermore, this is a minimal figure, based largely on measurements from teaching hospitals, where the staffs of the radiological departments tend to be more than usually "radiation-hazard-conscious." Mr. S. B. Osborn, who signed the relevant appendix to the M.R.C. report, gave the opinion (p. 118) that a realistic estimate of the contribution from diagnostic radiology might be considerably greater than this figure. Later he and Mr. Smith [6] envisage the possibility that it might be greater by a factor of 10. This would make the total dose of man-made radiations more than 220% of that due to natural background radiation. On the other hand, it seems unlikely that the natural background in the granitic areas of Britain or Scandinavia shows a rise of more than 100% over that in non-granitic areas.[3] I therefore now doubt whether a survey in these countries could be successful, because it seems probable that the effect of the higher natural radiation background would be swamped by the effects of the imperfectly known but certainly large diagnostic exposure. Thus Professor Haldane and I reach the same conclusion, though for very different reasons.

It is still desirable to obtain, if possible, a fiducial limit (at least) to the mutation-rate-doubling dose for a sample of human genes. One may therefore ask what other opportunities there may be. I can visualise two. First, it might yet be possible to find two sufficiently large populations which were genetically similar, which had been little exposed to diagnostic radiology, and of which one lived in a region where the natural background radiation level was several times that in the other's. A second approach might be through parents who had been exposed to large and estimable doses of therapeutic radiation. Such a possibility is disclosed by the information, given by Dr. W. M. Court Brown and Dr. R. Doll in appendix B of the M.R.C. report, that there are available in this country the case records of 11,287 men treated by radiotherapy for ankylosing spondylitis. Mr. Osborn has measured the gonad dose in this procedure and informs me that it may well be as high as 90r. There are also numbers of women who have received large gonad doses in attempts, often successful, to stimulate ovula-

1. *J. Obstet. Gynæc., Brit. Emp.* 1946, **53**, 487.
2. *Ibid*, 1949, **56**, 189.
3. Hazards to Man of Nuclear and Allied Radiations. H.M. Stationery Office, 1956.
4. Carter, T. C. Proceedings of International Conference on Peaceful Uses of Atomic Energy. New York, 1956; vol. 11, p. 384.
5. *Brit. J. Radiol.* 1952, **25**, 387.
6. Osborn, S. B., Smith, E. E. *Lancet*, 1956, i, 949.

tion; and, in some countries there are men who have been given large gonad doses to induce temporary sterility for contraceptive purposes. All these represent opportunities for direct study of the genetic effects of radiation in man which may be fleeting, since it is to be hoped that the practice of exposing the gonads of potential parents to large radiation doses will in the future be greatly diminished. It would be a pity to miss these opportunities.

I am grateful to Mr. Osborn for permission to quote his unpublished measurements of the gonad dose in the treatment of ankylosing spondylitis.

Harwell. T. C. CARTER.

DEATH UNDER CHARLES II

SIR,—When time stops, as it does in the Appalachian highlands in Kentucky and Tennessee, it sometimes allows us presently to scrutinise the past. Although Mr. J. S. Hall [1] was puzzled by "tissick" and "flox" as a cause of death about 1660, these words have long been current in the hillbilly thesaurus, which includes many other exotic Elizabethan expressions. To us they mean asthma and diarrhœa.

The S. E. Massengill Company, Bristol, Tennessee, U.S.A. P. E. CARMAN
Executive Director of Research.

PARTHENOGENESIS IN HUMAN BEINGS

SIR,—I am sure that all interested in problems of homografting will agree with Dr. Spurway and Dr. Nicholas (July 7) that parthenogenesis may be excluded in the case of Miss Alpha, recorded in Dr. Balfour-Lynn's letter of June 30. I do not agree, however, with Dr. Nicholas's statistical arguments.

In cases such as this the term "expected frequency" is preferable to "probability." If one were testing a new antibiotic and found a value for $P=0{\cdot}01$, one's confidence in the result would not rest on the statistic alone but would be reinforced by in-vitro tests, &c. Furthermore each successful repetition of the test will lower the over-all value of P, so that after 4 experiments it might be less than one in a million.

The situation with regard to the resemblance in blood-group antigens and phenyl thiocarbamide tasting between Mrs. and Miss Alpha is quite different. Here repeated observations should not tend to diminish the value of P. If 0·0114 is a true statement concerning the English population, the larger the sample tested the more closely should this figure be approached. If one found appreciably less than 100 such cases in 10,000 tests the technique would be suspect.

A condition with an incidence of 1% is not really rare. Albinism has an incidence of about 1 in 20,000, yet any observant person will see a case in a large city. When one considers the large numbers investigated for blood-group antigens, Dr. Balfour-Lynn's experience may be disappointing but it is not surprising.

Department of Pathology, Guy's Hospital Medical School, London, S.E.1. P. A. GORER.

Dr. A. E. Mourant, director of the M.R.C. Blood Group Reference Laboratory, writes:

"In his letter of June 30 Dr. Balfour-Lynn kindly thanks me for 'samples of the rare blood-group sera' which were obtained from this laboratory. No other mention is made of my name. In an article in the *Daily Mirror* of June 29, 1956, based on Dr. Balfour-Lynn's letter, there is a headline 'Doctors' names and official report revealed last night' and a list of 'the research team' including my own name. I should therefore like to make it clear that neither I nor any other member of the staff of this laboratory took part in the investigation, and that I am in no way responsible for the conclusions reached in either the letter in *The Lancet* or the article in the *Daily Mirror*."

1. *Lancet*, 1956, i, 344.

FIRST-AID MANUALS

SIR,—Dr. Watson's letter of June 30 raises several vital points.

1. The various and often opposing advice given in the standard first-aid manuals is more than confusing to first-aiders, who are in no position to argue the merits of the different methods. Standard treatment should be common to all these manuals.

2. The first-aid manuals should not only be brought up to date but should also eliminate much useless material, copied from one edition to the next in order to add frills to first-aid competitions rather than to help the injured person.

3. Who is best qualified to write such a textbook for the first-aid organisations? Dr. Watson has suggested the industrial medical officer and the accident surgeon, both of whom are in daily contact with large numbers of casualties and would, in my view, be the persons best suited for the task.

Simultaneously with the revision of the first-aid manuals it would be necessary for the contents of first-aid boxes within industry to be altered to conform with the altered technique. This would necessitate a change of heart on the part of the Ministry of Labour and National Service who, though already in possession of amendments suggested by the Association of Industrial Medical Officers, do not seem inclined to take the necessary action.

The difficulties of getting large organisations such as the voluntary first-aid societies to coöperate in producing a standard manual are appreciated; but if they would accept advice from a combination of accident surgeons and industrial medical officers, first-aid in this country would become less of a game and more of a reality.

Sheffield. R. A. TREVETHICK.

INTERMITTENT POSITIVE-PRESSURE RESPIRATION

SIR,—I have read the letter from Dr. Sandiford and Dr. McDonald in your issue of June 23. While I deprecate the attachment of my name to a valve which is only an adaptation of the Henderson-Haggard valve, and which was never intended to be more than a stop-gap device until something better could be produced, I would like to make some comments on their criticisms, which may mislead other users of the valves.

These valves vary greatly in performance according to the quality of the rubber used, and different manufacturers have very different ideas on what is suitable. None of them tally with my ideas on the subject. Also, the properties of the rubber inevitably change with age and repeated sterilisation. The only really suitable material is a silicone rubber. The valves as originally made here showed no sign of short-circuiting between the inlet and expiratory orifices and did not change over to the expiratory position until the pressure in the machine and connecting tubes had fallen to zero. Under these conditions there is no possibility of error due to compressibility effects. There may, however, be a small amount of rebreathing.

Turning now to the test procedure used by Dr. Sandiford and Dr. McDonald, I would point out that the use of a weight-loaded spirometer as a "patient" is most undesirable. The first objection is that the pressure-volume characteristic of such a system is a step function, no volume change taking place until a certain critical pressure is reached; and beyond that point no further increase in pressures occurs with increasing volume. If comparative tests of apparatus are to have any meaning, a "patient" having a linear pressure-volume characteristic must be used. The second objection applies only to water-seal types of spirometer and not to bellows types. It is the difficulty of calculating sufficiently accurately the correction which must be applied for the displacement of the water in the seal when a positive pressure is present in the bell. An error of 50 c.cm. in calculating this correction could easily arise with some types of spirometer.

For these reasons, a bellows with spring control is the most satisfactory form of "patient" for test purposes. A standard test set of this type has been developed by the

Breathing-machines Group of the Ministry of Health Working Party on Medical Supplies, under the chairmanship of Dr. W. H. Kelleher, and a prototype has already been constructed by Captain G. T. Smith-Clarke. The experiences of Dr. Sandiford and Dr. McDonald show only too clearly how important it is that users of positive-pressure breathing-machines should have such a test set available, so that defective valves and machines will not be used in treating critically ill patients.

Stoke Mandeville Hospital, Aylesbury, Bucks. F. D. STOTT
M.R.C. external staff.

SIR,—Dr. Sandiford and Dr. McDonald make a number of criticisms of our article of May 26. We would make the following comments:

1. We were well aware of the dangers attached to using an endotracheal tube, but at the time we had no adequate tracheotomy tube.

2. The primary cause of death was obviously the recurrent acute dilatation of the stomach leading to respiratory obstruction and ultimately to surgical emphysema, and not the ulceration of the trachea caused by the shape of the tube, as stated by Dr. Sandiford and Dr. McDonald.

3. We stated that the use of the Radcliffe respirator was not satisfactory, but we feel that the technique of "finger respiration" gave adequate ventilation during the periods when acute dilatation of the stomach was not hindering diaphragmatic movement. The comment of your correspondents that "the methods used are known to have been inadequate" is too sweeping.

4. The experimental evidence presented in their letter, showing the defects of the Stott valve, is very much appreciated by us.

5. We would support their plea that the experiences and knowledge gained on the few isolated respiratory units should be pooled.

King George VI Hospital, Nairobi. W. E. LAWES
J. R. HARRIES.

RESTRICTION OF ANTIBIOTICS

SIR,—We have previously stated that antibiotics and antiseptics were cut to the minimum at this hospital. We are now reaping the benefit of our long self-imposed restriction of antibiotics, for there has been no sign whatever of the antibiotic-resistant staphylococcus of which (as you said on May 5) "hospitals are experiencing an epidemic . . . which may spread to the general population." No "broad spectrum" antibiotic has ever been used here, nor has any operation been done under an umbrella.

This restriction of antibiotics is not the only reason for our freedom from the "H bug," as it is popularly called in New Zealand (H for hospital): other reasons are that the infants are handled solely by their mothers (to whose organisms they are very largely, if not completely, immune) and that any residual and resident organisms are continually chased away and given no rest by "spring cleaning" each room between patients. Thus every infant comes into a perfectly clean and well-ventilated little room, and has no contact via hands or air with any other patient. This, plus restriction of antibiotics, has undoubtedly saved infant lives and given them more functional lives because of freedom from scar tissue.

Our sparing use of antiseptics is easily explained. Infant epithelial cells are more readily destroyed than micro-organisms, and an antiseptic in strength sufficient to kill bacteria will certainly kill the upper layer of epithelium, as shown frequently by desquamation. The same antiseptic, however, will not destroy organisms inhabiting the ducts of sweat-glands and sebaceous glands; and therefore there remains in contiguity to the wound a mixture of dead or dying tissue and bacteria—a very bad combination. It is impossible to sterilise the ducts, but one can avoid killing the tissue. (Many a Thiersch graft has been dead before it was cut, because of too much antiseptic.) Moreover it is the uppermost epithelial cells which are most valuable in repelling the entry of extraneous organisms.

This sparing of antiseptics is made possible by the fact that patients do not come to the operating-table with large samples of ward organisms on their skins, nor in their mouths and noses, nor on their clothing. The mother nurse has been for our work a more reliable agent for avoiding infection, which used to be so common, than antibiotics and antiseptics.

Bassam Hospital, near Wellington, N.Z. CECILY M. PICKERILL
H. P. PICKERILL.

FATS AND DISEASE

SIR,—I had not intended to infiltrate your columns again, but Dr. Pomeranze's letter last week, concerning a possible relation between the type of fatty acids in evaporated milk and cholesterol levels in infants, comes near to an important disease in which I have some evidence for a rôle of essential fatty acids (E.F.A.). In a communication to the Medical Research Society this afternoon I shall be presenting such evidence for "idiopathic" hypercalcæmia of infants—a disease which I would have included in the "etcetera" of my letter of April 7 had not that category become rather full.

In brief, cow's milk contains considerably less E.F.A. than does human milk, and there is a slight loss in evaporation of milk. There is a greater loss in the production of National dried milk (N.D.M.) made by passage over hot rollers. So, compared with what their intake would be on breast-milk, infants fed on N.D.M. are likely to be deficient in E.F.A. I have found that rats deficient in E.F.A. are much more sensitive to toxicity with vitamin D, and this I believe may be because vitamin D is normally esterified with E.F.A. as is cholesterol which it structurally resembles. Therefore in deficiency of E.F.A. one might expect a rise in unesterified vitamin D (which is known to be more active than esterified) or in abnormally esterified vitamin, and a rise in mainly unesterified cholesterol; the rise in vitamin A might have a similar origin. Hence the increased sensitivity to vitamin D to which you have called attention (June 30) in the presence of liberal but not normally toxic amounts of vitamin D and calcium. Hence also the hypercholesterolæmia, and perhaps the mental retardation through imperfect formation of phospholipids in the brain which normally contain an essential fatty acid. Hence also the prevalence in this country where N.D.M. rich in vitamin D is consumed, rather than in the U.S.A. where evaporated milks richer in E.F.A. are usual for artificially fed infants.

May I take this opportunity to correct an error in the letter from Dr. Ancel Keys (April 28) who accuses me of recently having "argued persuasively that Eskimos have long since ceased to eat high-fat diets"? I am aware that this is not the first time he has misquoted my paper; others have correctly quoted me as supporting just the opposite view, which indeed can be obtained by reading the summary of my paper which starts: "The Eskimo is a typical carnivorous animal subsisting largely on raw meat and fat. . . . The typical dietary . . . is high in fat." More interesting is his mention of three Minnesotans who have been or are interested in E.F.A. and to whose work we are all indebted. But E.F.A. in relation to atherosclerosis appear to be unpopular now in Minnesota since the *Symposium on Atherosclerosis*, presented by the Minnesota Heart Association and the University of Minnesota in September, 1955, contains only a single mention of E.F.A. in its 186 large printed pages, and that not in the paper by Brock and Bronte-Stewart but near the end of the paper by Malmros and Wigand, in which corn oil as contrasted with vegetable margarine was found to lower serum-cholesterol. These Swedes make the significant statements: "The favourable results obtained

with corn oil might possibly be due to the abundance of essential fatty acids in this kind of fat. As much as 57 per cent of corn oil consists of linoleic acid"; and, "we have recently eliminated margarine from the diet." (Professor Yudkin please note.)

Oxford. H. M. SINCLAIR.

Parliament

Royal Assent

THE Clean Air, Agriculture (Safety, Health and Welfare Provisions), and Family Allowances and National Insurance Bills have received the Royal Assent.

Death Penalty (Abolition) Bill

On July 10, after a two-day debate, the House of Lords rejected this Bill by 238 votes to 95.

QUESTION TIME

Doctors' Claims

Lieut.-Colonel MARCUS LIPTON asked the Minister of Health what claims for increased pay for doctors he had received from the British Medical Association and other bodies; and what action he was taking.—Mr. R. H. TURTON replied: A memorandum outlining a claim for increased remuneration for general practitioners and hospital staff has been submitted. I am not yet in a position to make any statement about it. Lieut.-Colonel LIPTON: Will the Minister, to avoid trouble over this serious claim, come to a decision without delay? Is the right hon. Gentleman to use the argument that the general practitioner, with an average income of £2300 a year, is already getting more pay than the right hon. Gentleman's parliamentary secretary, who has the whole service to look after?—Mr. TURTON: I think it would be ill-mannered and, indeed, unethical for me to answer that supplementary question before I had informed the medical profession about it.

Neglected Persons

In answer to a question, Mr. TURTON said that in response to inquiries made in February and March of this year by the Board of Control, 5732 mentally defective patients were reported as having been found neglected by a judicial authority and dealt with under the Mental Deficiency Acts while in the care of public or charitable bodies. About 2000 cases had been reviewed to date. Mr. ARTHUR BLENKINSOP: Does not the right hon. Gentleman agree that this is a serious position in which it appears that detention has in fact been illegal? If on review these cases are to be released, is any provision to be made of alternative accommodation for them?—Mr. TURTON: Whether they were properly found neglected is a legal matter in which I cannot interfere. They have been brought to me or to my predecessors on justices' orders as found neglected, and it is my duty to take care of them. I am making a review of the cases, especially those out on licence. Of the 536 licensed cases, 330 have been discharged to date.

Board of Control

Dr. DONALD JOHNSON asked the Minister if he was aware of the confusion in the public mind created by the fact that the Board of Control, previously located independently, had now an identical address with the Ministry of Health; and if he would arrange for adequate recognition of the separate existence of the board as an independent body.—Mr. TURTON: I think that the separate existence of the board as an independent body is widely recognised. It is convenient for administration that the Ministry and the board should be in the same building. Dr. JOHNSON: May I, none the less, ask my right hon. Friend if he can make it quite clear that the functions of the Board of Control are to protect the liberty of the subject, and whether he is aware that, admirably intentioned though the board may be, it has in fact given the impression in recent times that it is both lethargic and inefficient in dealing with matters related to the individual and in replying to individual communications addressed to it?—Mr. TURTON: I can assure my hon. Friend that proximity to me does not induce lethargy or inefficiency.

Dr. JOHNSON asked the Minister if he was aware that the telephone number of the board was not in the London Telephone Directory; and if he would make arrangements for the appropriate insertion to be made.—Miss PATRICIA HORNSBY-SMITH: Yes, Sir. Dr. JOHNSON: May I thank my hon. Friend for removing at least one obstacle to the normal access to the board.

Schools for Maladjusted Children

Mr. J. E. MACCOLL asked the Minister of Education whether he was aware that in London a child ascertained to be maladjusted had to wait about six months for placing in an appropriate school; and whether he would take immediate steps to secure the provision of more places in schools for maladjusted children.—Mr. DENNIS VOSPER, parliamentary secretary to the Ministry, replied: The average waiting period for London children found to need treatment for maladjustment is four months. Some senior boys may have to wait longer. The L.C.C. is opening another day-school in September and will provide further boarding-places early next year. Mr. MACCOLL: Can the hon. Gentleman say how long the wait is to be before he is really going to do something about this? Is he aware that in the meantime many of these children are not only making themselves miserable but are making miserable everybody else in the schools in which they are; and will he bear in mind how long the committee was in making its report, and that it is absurd for him to continue putting off this question time after time?—Mr. VOSPER: I appreciate the importance of this matter, and the London County Council has, I think, three other schools in mind. There has been an improvement compared with 1951, when the waiting period was six to twelve months.

Unfit for National Service

In a written answer Mr. IAIN MACLEOD, Minister of Labour and National Service, said that the proportions of National Service men discharged on medical grounds shortly after entry into the Army and R.A.F. are 7 and 13 per 1000 respectively.

Appointments

LEWIS, T. D., M.B. Lond., D.P.H.: deputy M.O.H. and principal school M.O., Pembrokeshire.
WILLIAMS, E. HAZEL, M.B. Durh., D.P.H., D.C.H.: senior M.O., Wiltshire.

The Hospital for Sick Children, Great Ormond Street, London:
ARNOLD, RACHEL, M., M.B. Manc., D.C.H.: asst. resident M.O. (Tadworth).
HAINES, ANN M., M.B. Brist., D.C.H., D.A.: junior resident anæsthetist (Tadworth).
HELEY, MARGARET M., M.B. Lond., D.OBST.: house-surgeon.
PULLON, D. H. H., M.B. N.Z., M.R.C.P.E., D.C.H.: house-physician.
WOODMANSEY, A. C., M.D. Leeds, M.R.C.P., D.P.M., D.C.H.: part-time M.O. in the department of psychological medicine.
WRIGLEY, F. R. H., M.B. Lond., D.OBST.: resident anæsthetist (Tadworth).

Diary of the Week

JULY 15 TO 21

Tuesday, 17th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Medicine.* Dr. H. L. Bockus (Pennsylvania): Functional Disorders of the Gastro-intestinal Tract.
BRITISH ASSOCIATION OF PÆDIATRIC SURGEONS
9.30 A.M. (*Combined meeting in London with the surgical section of the American Academy of Pædiatrics.*) Dr. W. T. Mustard (Toronto), Mr. D. J. Waterston, Dr. R. E. Bonham-Carter, Dr. R. Edwards: Cardiac Surgery in Infancy. (Opening of three-day meeting.)
INSTITUTE OF CHILD HEALTH, The Hospital for Sick Children, Great Ormond Street, W.C.1
5 P.M. Dr. W. T. Mustard (Toronto): Surgical Correction of Total Anomalous Pulmonary Venous Drainage. (Simpson Smith lecture.)

Wednesday, 18th

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Dr. R. W. Riddell: Mycology.

Thursday, 19th

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Dr. Riddell: Mycology.
INSTITUTE OF PSYCHIATRY
5 P.M. (Maudsley Hospital, Denmark Hill, S.E.5.) Prof. K. A. C. Elliott (McGill University): Metabolism of Human Cerebral Tissues.

Friday, 20th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
4 P.M. Mr. B. W. Fickling: Oral Surgery Involving the Maxillary Sinus. (Tomes lecture.)
INSTITUTE OF CHILD HEALTH
5 P.M. Dr. Sidney Farber (Boston): Progress in the Chemotherapy of Disseminated Cancer in Children.

Notes and News

PAIN IN THE NECK

NECK pain was discussed at a clinical forum held at the Ciba Foundation, London, on June 11.

Mr. H. OSMOND-CLARKE drew attention to two useful radiographic signs in cases of acute neck pain. The first was the straight cervical spine, with loss of the normal lordosis; and the second was kinking of the normal cervical curve at the site of the lesion. These signs were especially valuable when there was no other radiographic abnormality. In his experience the majority of cervical-disc lesions responded to cervical or skeletal traction, followed if necessary by the application of a plaster collar; only a small proportion of cases required operative treatment.

Sir FRANCIS WALSHE, F.R.S., said that, in his opinion, in elderly patients some "pain in the neck" and gradual reduction in the range of neck movement were physiological. The correlation of radiographic changes with symptoms was very difficult, and he had seen people with gross radiographic changes who had no symptoms whatever. He described a case of chronic bulbar palsy which had presented with findings suggesting a central cervical-disc protrusion, which it seemed might be due to recent trauma. Myelography revealed the appropriate central disc protrusion, but the correct diagnosis became apparent shortly before an operation was to be undertaken on the disc lesion.

Mr. J. E. A. O'CONNELL reviewed a small series of cases of proven cervical-disc lesion which had been symptomatically improved by operative treatment. He attempted to correlate the type of pain and its distribution with the type of lesion found at operation, and emphasised that referred pain from a cervical-disc lesion was not necessarily due purely to root irritation.

Dr. A. T. RICHARDSON described the condition of acute painful stiff neck which, in his experience, more people were coming to attribute to derangement of the apophyseal joints, rather than to an acute disc lesion. There was usually some remission after a few weeks, but occasionally dramatic relief followed manipulation or neck traction.

Dr. I. H. M. CURWEN urged that the results of the unqualified manipulator should not prejudice the profession against the value of this method. Several cases of paraplegia following manipulation of the neck were reported, and Sir FRANCIS WALSHE and Mr. DONALD BROOKS were among those who opposed manipulation.

Speakers referred to the value of simple instructions regarding posture while asleep; the use of a single pillow was generally accepted as advisable. One speaker declared that a "bow-tie" pillow (a ribbon tied tightly round the waist of an ordinary pillow) had proved useful.

HEARING-AIDS

AT Croydon patients using 'Medresco' hearing-aids have had difficulty in obtaining spare parts and replacements, owing to the lack of a local hearing-aid centre. The local executive council approached the Ministry of Health, and arrangements have now been made with the nearest centre for any medresco user living some way from this centre to have a spare receiver lead wire. This will be issued on request, the issue being entered in the user's battery book; and when a lead becomes defective, the user is to send this with his battery book to the centre, which will send a further spare lead. Mr. S. C. Sullivan, clerk of the council, remarks that this arrangement at Croydon may be of interest elsewhere in the country where patients live beyond easy reach of a hearing-aid centre.

MENTAL ILL HEALTH

A RECENT issue of the *Twentieth Century* [1] contains a series of informative and readable articles on mental-health topics. Dr. Elliott Jaques writes on psychopathology in industrial life, Dr. Emanuel Miller on methods of psychotherapy, Dr. Humphry Osmond on basic problems in mental illness, and Dr. E. Stengel on empirical treatments in psychiatry. Dr. J. R. Smythies's article on the relation of brain to mind clarifies without over-simplifying this profound problem. The laymen are capably represented by Barbara Wootton, who discusses mental illness from the standpoint of ethics; by Cecily Mackworth, who gives a sensitive, perceptive account of her stay in a neurosis centre; and by a nurse, who describes the sadistic methods occasionally used in mental hospitals. D. A. Sington, of the *Manchester Guardian*, contributes a good account of the treatment of the criminal psychopath in Sweden, contrasting this with our limited facilities but paying tribute to the pioneer work at Wormwood Scrubs.

1. Twentieth Century, May, 1956. 2s. Obtainable from 26, Bloomsbury Way, London, W.C.1.

University of Oxford

On June 21 the degree of D.M. was conferred on Christopher Pallis.

University of Durham

At congregations on June 29 and 30 the following degrees and diplomas were conferred:

M.D.—John Anderson, Geoffrey Ismay, Sheilagh M. C. Murray, A. J. Smith, * J. F. Webb.

M.B., B.S.—T. N. K. Allan, Patricia C. Allen, A. A. Beeson, Keith Beveridge, Garry Blessed, Marie R. Campkin, J. W. Cash, E. C. Cawte, E. J. Clandillon, F. D. Corner, D. H. G. Cowie, D. D. Craig, J. W. Cromby, A. M. Davison, F. M. Elderkin, J. S. Fawcett, Alan Ferguson, Ridley Gibson, Reginald Hall, D. F. Henley, E. S. Hughson, * R. P. Jerman, Margaret I. C. Johnston, J. B. Jones, A. F. Lambert, Léon Le Dune, Alan Lewis, Peter Leyburn, A. W. Lillington, Adetokunbo Olumide Lucas, Michael McKendrick, Bernard McStay, Jill E. E. Marchant, I. T. Miller, J. E. Miller, J. F. Moody, * A. B. K. Morrall, P. C. Nicholson, Alexander Osmond, G. A. Parker-Sutton, R. R. Pearson, P. A. Robson, B. R. Roy, Pritam Singh Sahni, Frank Scott, M. T. Shaw, W. B. Shaw, B. M. Smith, M. G. Spark, J. C. Stoddart, J. W. Tuke, Enid B. Turton, * J. W. Watson, S. B. Williams, Alan Willman, John Wilson, A. J. Wort.

D.P.H.—Joan A. Barrett, E. I. Blenkinsop, C. E. Camm, Maureen M. Henderson, Joyce H. Hindmarsh, John McCormack Millicent W. Payne, Helen H. Reid.

D.P.M.—Rosemary Dearden, Leonard W. Robinson.

* In absentia.

University of Manchester

At recent examinations the following were successful:

Ch.M.—Harold Bolton.

M.B., Ch.B.—Robert Abendstern, M. B. Bailey, J. H. E. Baines, A. T. Battle, J. R. D. Bedford, Keith Boothby, Robert Brown, A. J. Burkhardt, K. N. Butteriss, D. H. Carroll, G. E. Clews, M. J. Conway, Avis P. Cook, F. B. Cookson, Raymond Crowther, Janet M. Dawson, J. M. Dickey, Hazel M. Fearn, S. B. Foulds, Elisabeth D. Hahn, T. M. Hardiker, Andrew Harris, Mary Heald, G. D. Hunt, Barbara Y. Hutchinson, Maureen P. Kenmare, J. A. Lee, J. D. Leece, A. H. Levy, J. B. Lynch, J. D. McLean, I. W. Manson, C. S. Mellor, Ronald Michaels, Raymond Million, Elizabeth A. M. Parkes, P. B. Parnaby, B. L. Poston, A. J. Ralston, Jean Rowley, Felicity H. Sambrook, G. B. Seddon, Jean Shackleton, David Smith, Rita Smith, Patricia V. Sutcliffe, Margaret M. Sutherland, W. R. Swinburn, W. F. White.

D.P.H.—F. R. Calvert, Marjorie T. Dare, Mary S. Gilbody, Katie Keane, G. A. Levell, Joan M. MacCarthy, L. G. Nicol, Geraldine T. O'Carroll, J. D. Willins.

University of Glasgow

On July 7 the following degrees were conferred:

M.D.—R. C. Curran (with honours); R. J. Calvert, J. T. G. Ewan and K. C. Wybar (with commendation).

Ch.M.—W. T. Irvine and W. B. Stirling (with honours).

M.B., Ch.B.—R. T. Abbott, Abdullah Abdurahman, George Abrani, D. C. Agbo, Eleanor M. Aitken, J. M. Allan, W. K. G. Allan, Catherine F. Anderson, R. L. Andrew, Sarah L. Armour, A. A. Atkinson, Safiya Azimuddin, Moira C. Baird, W. L. M. Baird, W. H. Beattie, J. M. Bell, Margaret J. A. Blackwood, Thomas Blair, B. B. Borthwick, M. F. Brewster, K. A. C. Brown (with commendation), N. M. Brown (with commendation), J. S. Bryden, G. D. Burnett, A. T. Calder, J. A. Caldwell, Veronica R. Carson, Georgina M. Chadwin, I. A. Chisholm, G. A. Clark, Cyril Comyns, Ruth S. R. Conacher, Peter Connelly, F. M. Cranna, J. M. Crombie, Martha K. Cuthbertson, John Dailling, T. W. B. Davidson, W. C. Davidson, Jean S. Dick, George Drummond, Adegboyega Adebowale Efunkoya, W. M. Elder, I. L. Felstein, A. K. Foli, William Frank, Abigail S. Fraser, J. B. W. Galloway, D. G. Garvie (with commendation), Lilian J. Geddes, S. W. George, I. B. Gibson, Jane M. B. Gilchrist, Mary L. Girkins, J. F. Glencross, J. G. Graham, R. C. Graham, J. H. Greig, R. C. Grieve, W. D. Guy, Elizabeth H. Hamilton, A. J. Hardie, G. A. Hayes, Robina M. Herd, Helen E. Holms, R. W. Irvine, Elizabeth J. Ives, Lewis Johnman (with commendation), David, Johnston, Julia A. Keane, John Keatings, John Kelly, I. R. Kernohan (with honours), I. F. Kerr, J. F. Kirk, I. B. Kirkland, A. H. Kleinglass, J. A. Laithwaite, T. W. Lindsay, Elizabeth R. Lohoar, I. T. Loudon, C. J. Macaulay, Sheila H. McCulloch, A. R. McCutcheon, Carrick McDonald, W. W. McDougall, Grace N. Macfarlane, W. G. McGhee, R. D. Macgill, J. G. McHugh, John MacKay, J. G. McKean, B. R. Mackenna, Harriet MacKinnon, Sheila A. H. McLaren, Jackson Maclean, B. G. P. Macnamara, Neil McNeil, A. D. McNeill, R. L. McRitchie, J. A. McShane, A. J. Marshall, Walter Marshall, A. M. Michael, William Miller, G. M. Milne, R. G. M. Mitchell, D. L. Morrison, John Morrison, J. J. Morrow, Nicol Morton, Alistair Munro, D. S. Munro, R. K. Murray, Alexander Neilson, Barbara J. Newman, T. L. O'Donnell, Babubhai Patel, E. H. Paterson, M. L. Peacock, J. L. Price, A. J. Rintoul, K. K. T. Robertson, Ann F. M. Savage, I. W. H. Scott, Joanna E. M. Scott, Mary B. Simpson, M. W. Smellie, Ian Soutar, David Stephen, R. M. Still, James Stothers, F. W. C. Surgener, Werner Susskind, R. M. R. Taylor, A. B. M. Telfer, J. A. Thomson (with commendation), R. G. B. Turner, D. A. L. Watt, Doris S. Whiteford, Stewart Wotherspoon, D. G. Young, J. J. Young.

University of Sheffield

The council has approved a proposal by the Medical Research Council to establish a unit for epidemiological research on respiratory diseases (air pollution) in the university. The unit will be under the direction of Dr. John Pemberton, senior lecturer in social and industrial medicine.

University of Edinburgh

On July 6 the Duke of Edinburgh, chancellor of the university, conferred the honorary degree of LL.D. on Prof. G. R. Cameron, F.R.S., and Dr. J. G. Greenfield.

University of Aberdeen

On July 5 the honorary degree of LL.D. was conferred on Sir Arthur Landsborough Thomson, D.SC., a secretary to the Medical Research Council since 1949.

The following degrees have also been conferred:

M.D.—B. H. Smith (honours); J. C. Mitchell (with commendation); James Brown, W. G. P. Mair.

M.B., Ch.B.—Audrey A. Dawson (with honours); N. A. Matheson, A. P. Condie, R. G. Clark, G. M. Copland (with commendation); A. B. Baillie-Hamilton, Barbara C. Bertram, C. M. Black, Margaret I. Blackhall, J. C. D. Booth, Margaret Brown, James Burns, Jane R. Caseley, G. G. Cockburn, E. P. Collins, D. L. A. Cunningham, N. L. Denham, R. J. Doig, P. T. d'Orbán, Lois E. Douglas, I. T. Draper, Iain Esslemont, G. C. Eyiuche, H. R. Falconer, Valerie Farr, P. B. Forbes, G. D. Fraser, G. C. Fraser, W. H. H. Garvie, Lionel Grant, N. M. Grant, Helen F. B. Grieve, Barbara J. Hunt, Abubakar Imam, W. S. Jamieson, Janet E. I. Jezzard, Marjorie L. Kemp, Anne H. Kinnell, R. F. B. Lees, M. G. Lyall, J. A. Lyon, J. D. Macdonald, Kenneth McLean, D. A. McLeod, Flora Macleod, Stephen McPherson, R. J. Manson, Anne Melvin, A. D. Michie, May Monro, A. B. Mulholland, Lesley M. M. Mutch, J. G. Noble, Cecil Rolbin, I. M. Slessor, G. W. Stephen, Helen L. Thomson, J. S. Watt, Charlotte H. Webster, R. C. D. Wilson.

University of St. Andrews

The degree of M.D. has been conferred on the following:

D. M. Green (with honours and a Rutherford gold medal), J. M. Black, Agnes K. Conn, *G. S. Nelson (with honours and a gold medal), *C. E. G. Smith (with honours and a Singapore gold medal), *J. T. Worsfold (with commendation), *J. C. S. Paterson (with commendation).

*In absentia.

At a recent final examination for the degrees of M.B., CH.B., the following were successful:

P. C. Robertson, J. G. Sprunt (with honours); Evelyn D. Morley, R. G. Clark, G. F. Baines, N. R. M. Buist, Gillian M. Watkins, (with commendation); E. O. Akinsete, J. M. Anderson, Laurance Barclay, W. J. Bassett, J. A. Bowles, Elizabeth A. J. Buchan-Hepburn, H. J. L. Burgess, W. B. Clarkson, G. D. Constable, B. V. M. Corps, Veronica J. Duffy, T. E. Durkin, J. U. Ekong, G. O. Exon, J. F. Farrugia, R. A. Flood, Sheila E. G. Fraser, S. C. Gardiner, A. E. Grace, D. J. Grubb, R. M. Halley, Ruth Healey, Mary E. Hibbert, Albert Jacob, Peter Lavis, Mary V. Lenton, D. J. F. MacDonald, C. P. McGinnis, J. M. Matthews, John Millar, M. J. R. Miller, A. A. Neil, Enyinnaya Nnochiri, D. H. Outram, E. R. L. Paton, D. H. Reid, Margaret J. Robertson, Jean S. Saggar, Margaret K. Simpson, W. D. Smith, D. L. Snow, T. F. Solanke, Janet F. W. Somerville, Helen M. Sprunt, J. M. Stewart, Josephine M. Turner, C. C. Wade, W. G. Wallis, R. A. Washbrook, W. N. Waugh, Basil Weir, Betty P. Westworth, J. R. Wilson.

University of Dublin

On July 5 at the school of physic, Trinity College, the following degrees were conferred:

M.D.—N. J. Ball, D. N. Golding, J. D. Llewellyn-Jones, D. K. Kiersey, Ruth M. Ransom, Blanche Weekes.

M.A.O.—H. D. Chomse.

M.B., B.Ch., B.A.O.—Pauline A. M. Bailey, M. T. Malone-Barrett, A. T. C. Bourke, C. B. Burke, J. A. D. Clinch, E. A. Elebute, George Futers, R. L. Golding, R. M. Hackett, W. P. Harrison, Elizabeth R. Hicks, E. L. Holland, R. J. N. Kerr, J. D. F. Lockhart, A. M. McCurdy, T. D. Mahony, Stanislaw Milewski, John Nolan, T. N. Pearson, M. A. M. Peszke, R. W. Pigott, Patricia A. T. Quin, E. H. Ritchie, D. A. Ryder, A. B. Smith, Eileen M. Whipp, Ann F. Williams, T. W. Williams, D. W. Wilson.

L.M., L.Ch., L.A.O.—R. L. Kent.

Royal College of Surgeons of England

On July 5, Sir Russell Brock and Sir Archibald McIndoe were re-elected members of the council. The result of the Poll was as follows:

	Votes
RUSSELL CLAUDE BROCK (Guy's Hospital) ..	1506
ARCHIBALD HECTOR MCINDOE (St. Bartholomew's Hospital)	1215
Rodney Honor Maingot (Royal Free Hospital) ..	867

In all 1888 fellows voted; and in addition 26 votes were found to be invalid.

British Association of Urological Surgeons

The following officers have been elected for 1956–57:

President, Mr. R. H. O. B. Robinson; immediate past president, Mr. Terence Millin; vice-president, Mr. Arthur Jacobs; hon. treasurer, Mr. J. G. Yates-Bell; hon. secretary, Mr. Howard Hanley; hon. editorial secretary, Mr. David Band; other members of council, Mr. J. D. Fergusson, Mr. F. R. Kilpatrick, Mr. W. S. Mack, Mr. Ashton Miller, Mr. T. W. Mimpriss, Mr. E. W. Riches, Mr. J. Cosbie Ross, and Mr. J. Swinney.

Royal College of Surgeons in Ireland

On July 6 the fellowship was conferred on J. O. M. C. Craig, and the licence on H. K. Takyi.

Royal Society of Arts

The gold Albert medal of this society for 1956 has been awarded to Sir Henry Dale, O.M., F.R.S., for "eminent service to science, particularly physiology."

British Association of Dermatology

At the society's annual dinner, to be held in London on Friday, July 20, Dr. G. B. Dowling, the president, is to present a portrait to Sir Archibald Gray in recognition of his services to dermatology.

Association of Industrial Medical Officers

The association's twenty-first anniversary is to be marked by a meeting in London on Sept. 24–28. Inquiries should be addressed to Dr. P. A. B. Raffle, A.I.M.O., Griffith House, 280, Marylebone Road, London, N.W.1.

Harveian Society of London

This society proposes to commemorate in June, 1957, the tercentenary of the death of William Harvey by holding an international scientific symposium on the circulation. Further particulars may be had from the hon. secretaries of the society, 11, Chandos Street, London, W.1.

British Journal of Radiology Jubilee

To commemorate the diamond jubilee of this journal Mr. Cuthbert Andrews, Sir Russell Brain, Dr. Russell J. Reynolds, and Dr. F. Gordon Spear have been elected to honorary membership of the British Institute of Radiology.

World Federation for Mental Health

The ninth annual congress of this federation is to be held this year in Berlin from Aug. 12 to 17. The theme of the meeting is to be mental health in the home, the institution, and the school. The offices of the congress are at Invalidenstrasse 52, Berlin, N.W.40.

United States Narcotics Bill

The *Times* (July 10) reports that both houses of the United States Congress on July 9 passed a Bill under which the death penalty could be incurred by persons selling heroin to minors. The Bill increases all other penalties for drug trafficking and forbids the use of heroin except for research. The Senate has endorsed the Bill.

British Medical Association

Occupational Health Prize (£50).—This prize is open to any member of the association engaged in the practice of occupational health. Candidates may select their own subject, but entries should be in a form suitable for publication and must include personal observations and experiences collected by the candidates in the course of their work. They must be sent to the secretary of the association, B.M.A. House, London, W.C.1, not later than Jan. 31, 1957.

Medical Problems of Adoption

This subject has been chosen as the theme of the Standing Conference of the Societies Registered for Adoption which is to be held at 10.30 A.M. on Monday, Oct. 22, at County Hall, London, S.E.1. The speakers will include Dr. A. B. Stewart, Dr. A. White Franklin, Dr. F. H. Young, Dr. Desmond Pond, Dr. Geoffrey Bourne, and Dr. C. S. Nicol. Further particulars may be had from the hon. secretary of the conference, Gort Lodge, Petersham, Surrey.

Royal Society

Under the Royal Society and Nuffield Foundation Commonwealth bursaries scheme awards have been made to the following:

Dr. W. R. Adey, senior lecturer in anatomy at Melbourne, to enable him to visit Great Britain to extend his studies on temporal-lobe epilepsy.

Dr. A. Mohiuddin, reader in zoology at Karachi, to enable him to study parasitic protozoa at the London School of Hygiene and Tropical Medicine.

Mr. H. Waring, D.SC., professor of zoology in the University of Western Australia, to work at Cardiff on the influence of melanophore hormone preparations on carbohydrate metabolism.

Tuberculosis in the Commonwealth 1955.—The transactions of the fourth Commonwealth Health and Tuberculosis Conference, held in London last year, have now been published under this title. Copies (30*s.*) may be had from the National Association for the Prevention of Tuberculosis, Tavistock House North, London, W.C.1.

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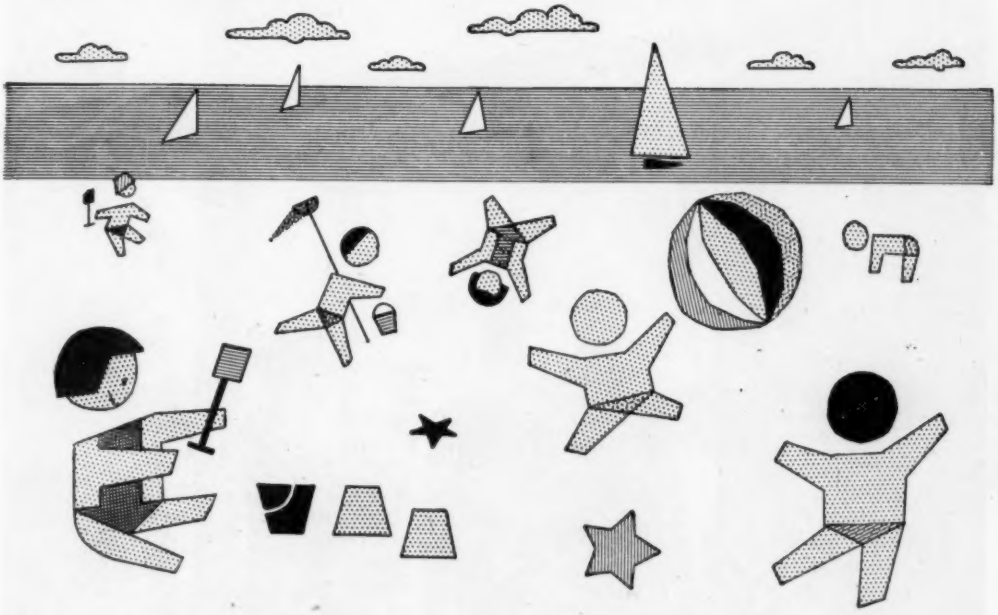

Precisely how warm weather influences the incidence of infective diarrhoea in children is uncertain, but the increased number of flies and amount of dust makes it more likely that milk and food will become contaminated, while the rapid multiplication in warm weather of the various organisms known to be associated with the disease may lead to increased virulence.

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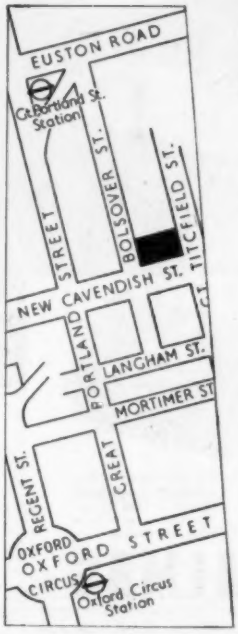

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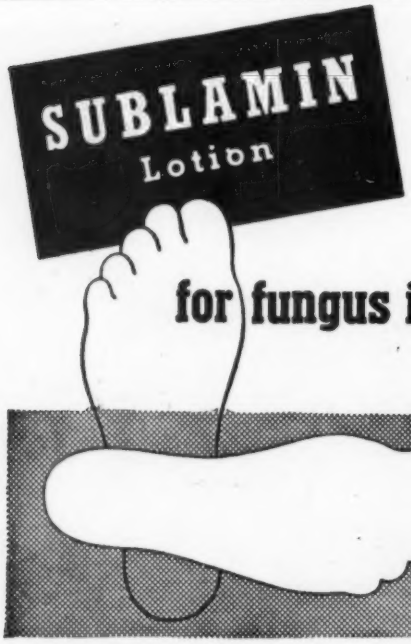

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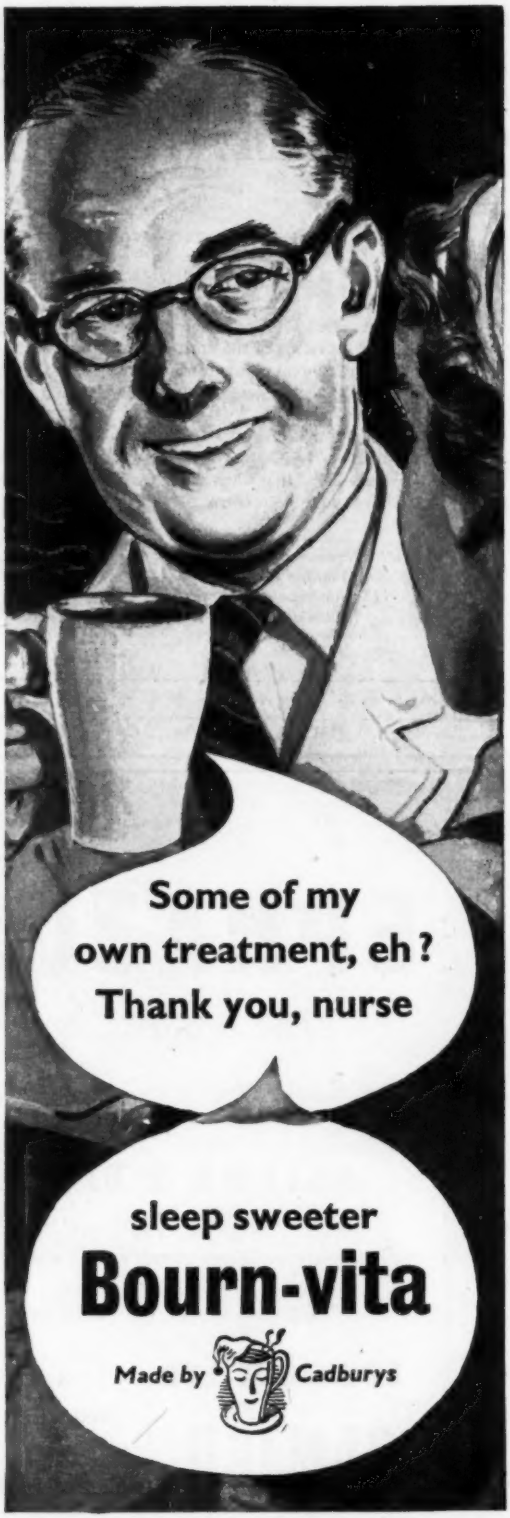

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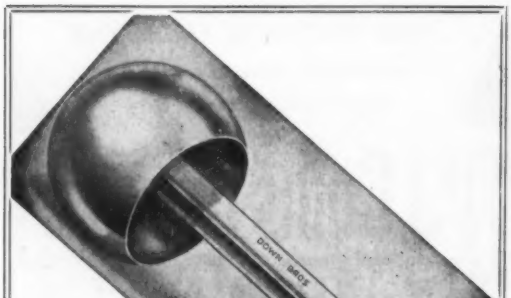

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Academic and Educational

ROYAL COLLEGE OF PHYSICIANS

SALTWELL RESEARCH FUND

Applications are invited for a Saltwell Research Fellowship, value not less than £1000 a year with superannuation arrangements. The Fellowship is for a period of 1 year, renewable up to a total period of 3 years. Under the terms of the Fund the Fellow appointed must engage in research work of any type, including clinical epidemiological or laboratory studies in connection with cancer, rheumatism, malaria or morbid conditions of the prostate gland.

Applications, accompanied by the names of 2 referees, should state details of the proposed work, under whom it is proposed to undertake the work and the name of the institution where the work is to take place. A grant for reasonable expenses may be paid to the institution concerned.

Further details may be obtained from the Secretary of the Trustees, the Assistant Registrar, Royal College of Physicians, Pall Mall East, London, S.W.1, by whom applications for a Fellowship must be received not later than 8th October, 1956.

ROYAL COLLEGE OF PHYSICIANS

LEVERHULME RESEARCH SCHOLAR

Applications are invited for a Leverhulme Research Scholarship, value of £1000 a year. The Scholarship will be for 1 year in the first instance and may be renewed for a maximum of 3 years. A scholar must satisfy the College that the major part of his time is spent on his research but he may be allowed to hold another appointment. Scholars must devote themselves to the investigation of some problem related to disease as it occurs in man, in any branch of medicine. The work must be done in some established institution, preferably in the United Kingdom, in which full facilities for the research are available.

Applications, accompanied by the names of 2 referees, should state details of the proposed work, the name of the individual under whom it is proposed to work and the Institution where the work is to be done.

Application forms may be obtained from the Assistant Registrar, Royal College of Physicians, Pall Mall East, London, S.W.1. Applications for the Scholarship must be received not later than 8th October, 1956.

UNIVERSITY OF LONDON

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY

(Incorporating the teaching facilities of Queen Charlotte's Maternity Hospital, Chelsea Hospital for Women and the Department of Obstetrics and Gynæcology at Hammersmith Hospital)

Applications are invited from graduates with a registrable qualification for enrolment for the AUTUMN TERM (3RD SEPTEMBER–1ST DECEMBER, 1956). Graduates attend each of the constituent hospitals in turn for clinical work, and attend lectures and special demonstrations at all 3 hospitals. Enrolment fee £3. Tuition fee £36 a term.

General practitioners wishing further experience in obstetrics may be accepted to attend the course at Queen Charlotte's Maternity Hospital for shorter periods—i.e., 2–4 weeks. They will have the opportunity of attending the labour ward in addition to combined classes of lectures and demonstrations at the 3 hospitals of the Institute. Ministry of Health grants are payable to approved general practitioners attending for a period of 2 weeks.

An INTENSIVE COURSE for those preparing for M.D. and M.R.C.O.G. will be held from 3RD DECEMBER to 15TH DECEMBER, 1956.

During the winter vacation, a limited number of graduates may attend the practice of the hospital.

Hostel accommodation is available at Queen Charlotte's Hospital and at Hammersmith Hospital.

Further particulars can be obtained from the Secretary, Institute of Obstetrics and Gynæcology, Chelsea Hospital for Women, Dovehouse-street, London, S.W.3.

UNIVERSITY COLLEGE, IBADAN, NIGERIA

CHAIR OF OBSTETRICS AND GYNÆCOLOGY

Applications are invited for Chair of Obstetrics and Gynæcology. Duties consist of clinical work, research and work preparatory to the clinical teaching of medical students. The department is expected to begin the move to the new teaching hospital in January, 1957. London University inspection will be requested with a view to accepting clinical students from October, 1957. Rich field for research. The Professor will be offered honorary contract as Consultant by Board of Management of University College Hospital. Salary at present : £2850 p.a. Appointment to retiring age (normally 60 years). Allowance for up to 3 children, £50 p.a. per child resident in Nigeria, £100 p.a. per child resident elsewhere. Part furnished accommodation at rent up to 7·7% of salary. Passages paid for member of staff, wife, and up to 3 children under 11 years on appointment, overseas leave and termination. F.S.S.U. Outfit allowance £60.

Applications (12 copies), detailing qualifications and experience and naming 3 referees, by 13th August, 1956, to Secretary, Senate Committee on Colleges Overseas in Special Relation, University of London Senate House, London, W.C.1, from whom further particulars may be obtained.

MENTAL HEALTH RESEARCH FUND FELLOWSHIP

Applications are invited for Mental Health Research Fund Fellowships from suitably qualified persons wishing to pursue full-time research work bearing on mental health problems whether in clinical psychiatry or in 1 of its supporting sciences. Both senior and junior fellowships are offered in the salary ranges of £700–£1200 and £1300–£2000 (inclusive of superannuation). The appointments will be for up to 3 years in the first instance.

Further information from the Secretary, Mental Health Research Fund, 43, Queen Anne-street, W.1.

GUY'S HOSPITAL

DIPLOMA IN PHYSICAL MEDICINE PART I

The next COURSE for this Diploma will begin during the first week of JANUARY, 1957.

Full particulars from Physics Department, Guy's Hospital Medical School, London, S.E.1.

L.M.S.S.A.

FINAL EXAMINATION : SURGERY, 13th August, 8th October, 12th November, 1956. MEDICINE, PATHOLOGY, 20th August, 15th October, 19th November, 1956. MIDWIFERY, 21st August, 16th October, 20th November, 1956. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, July and December.

For regulations apply REGISTRAR, Apothecaries Hall, Black Friars-lane, London, E.C.4.

UNIVERSITY OF BIRMINGHAM. Faculty of Medicine. The University invites applications for the post of Whole-time LECTURER IN EXPERIMENTAL PSYCHIATRY (Grade I—Clinical). The Lecturer will be responsible with the Head of Department (Prof. J. Elkes) for the planning, supervision and conduct of clinical research in the Department, and will be required to take part in such undergraduate and postgraduate teaching as is undertaken by the Department. Wide experience of clinical psychiatry, as well as personal experience in clinical investigation, is required. The salary range is from £1750 to £2400 p.a. The successful candidate will be recommended for the award of an honorary contract of service with Hospital authorities.

Applications (3 copies), with names of 3 referees, should be sent by 31st July, 1956, to the Assistant Registrar, the Medical School, Birmingham, 15, from whom further particulars may be obtained. G. L. BARNES, Secretary.

The University, Birmingham, 15, July, 1956.

UNIVERSITY OF BIRMINGHAM. Faculty of Medicine. DEPARTMENT OF EXPERIMENTAL PSYCHIATRY. Applications are invited for the post of SENIOR RESEARCH FELLOW IN PSYCHOLOGY to take part in collaborative studies on the action, and the mode of action, of drugs on mental function in man. Experimental and clinical facilities are available in the newly equipped Clinical Research Laboratories of the Department, and at the Birmingham Regional Hospital Board Psychiatric Early Treatment Centre (Uffculme Clinic, Moseley). The starting salary, which will be within the Grade II Lecturer scale (£650–£1350 p.a., or £700–£1700 p.a. if medically qualified) will be determined by the candidate's qualifications and experience. The appointment will be for 1 year in the first instance, and is renewable annually.

Applications, (3 copies), with names of 3 referees, should be sent by 31st July, 1956, to the Assistant Registrar, the Medical School, Birmingham, 15. G. L. BARNES, Secretary.

The University, Birmingham, 15, July, 1956.

UNIVERSITY OF BIRMINGHAM. Faculty of Medicine. DEPARTMENT OF EXPERIMENTAL PSYCHIATRY. Applications are invited for the post of SENIOR RESEARCH FELLOW IN NEUROCHEMISTRY to take part in collaborative studies on the mode of action of drugs on higher nervous activity. Both experimental and clinical facilities in newly equipped laboratories are available. The starting salary, which will be within the Grade II Lecturer scale (£650–£1350 p.a., or £700–£1700 p.a. if medically qualified) will be determined by the candidate's qualifications and experience. The appointment will be for 1 year in the first instance, and is renewable annually.

Applications (3 copies), with names of 3 referees, should be sent by 31st July, 1956, to the Assistant Registrar, the Medical School, Birmingham, 15. G. L. BARNES, Secretary.

The University, Birmingham, 15, July, 1956.

UNIVERSITY OF BRISTOL. Applications are invited for an appointment as DEMONSTRATOR IN PATHOLOGY. Salary scale £700–£50–£900 p.a. according to qualifications and experience. The duties include assistance with the teaching of medical and dental students and general pathology for veterinary students, and the conduct of autopsies. Facilities for research and experience of diagnostic histology are available.

Applications, giving full names, age, qualifications, details of education and experience, together with the names of not more than 2 referees, should reach the undersigned, from whom further particulars may be obtained, on or before 8th August, 1956. H. C. BUTTERFIELD, Registrar and Secretary.

THE UNIVERSITY OF LIVERPOOL. Applications are invited from medically qualified candidates for the post of LECTURER in the Department of Public Health, on the salary scale £1000–£100–£1700–£50–£1750 p.a. Arrangements will also be made for the successful candidate to be appointed Honorary Assistant Medical Officer of Health in the City of Liverpool Public Health Department, ensuring wide scope for practical work in the field of public health.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be received not later than 30th July, 1956, by the undersigned, from whom further particulars of the conditions of appointment may be obtained. STANLEY DUMBELL, Registrar.

THE UNIVERSITY OF MANCHESTER. Applications are invited from candidates with medical qualifications registrable in this country for the post of LECTURER IN ANATOMY. Good research facilities are available. Salary (£ sterling) on the scale £1000–£1800 p.a. with membership of F.S.S.U. and children's allowance scheme ; initial salary according to qualifications and experience. The successful candidate will be expected to take up his duties as soon as possible.

Applications should be sent, not later than 7th August, 1956, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained. Overseas applicants should send letters of application giving details of qualifications and experience, and should submit the names of at least 3 persons to whom reference may be made.

Hospital Services : Senior Appointments

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited for the post of HONORARY DENTAL SURGEON.

Applications (28 copies) should be sent to the undersigned on or before 16th August, 1956. Testimonials are not required but the names of 3 persons willing to act as referees should be furnished. Sister MARY CLARE, Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited for the post of HONORARY ASSISTANT RADIOLOGIST (diagnostic), for a minimum of 4–5 sessions weekly. Candidates must have a Diploma in Radiology.

Applications (30 copies) should be sent to the undersigned on or before 30th August, 1956. Testimonials are not required, but the names of 3 persons willing to act as referees should be furnished. Sister MARY CLARE, Secretary.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. Locum PSYCHIATRIST required for 4 or 5 sessions a week for period 7th August–31st August. Salary 3½ guineas per session.

Apply, giving particulars of qualifications and experience, to Secretary of Hospital.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, London, W.1. Applications are invited for the appointment of Part-time CONSULTANT ANÆSTHETIST (4 sessions).

Applications, stating age, qualifications, and details of present and previous experience, with names of 3 referees, to undersigned, from whom further particulars can be obtained, by 11th August.

Col. E. K. WOOD, House Governor and Secretary.

234, Great Portland-street, London, W.1.

ST. BARTHOLOMEW'S HOSPITAL, London, E.C.1. Applications are invited for the post of PHYSICIAN in the Department of Psychological Medicine (Consultant status). This post will be tenable from 1st January, 1957. Candidates must be Members or Fellows of the Royal College of Physicians and must have had considerable experience in clinical psychiatry in all its aspects, including teaching experience. The appointment will be for 4 sessions weekly.

Applications (10 copies), together with the names of 3 referees, should be submitted to the undersigned within the next 21 days.

C. C. CARUS-WILSON, Clerk to the Governors.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Dudley ROAD HOSPITAL. (780 Beds.) 2 Whole-time ASSISTANT RADIOLOGISTS (£1575–£2025 p.a.). Diploma Diagnostic Radiology/wide experience specialty essential.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 30th July, 1956.

CHELMSFORD, ESSEX. BROOMFIELD HOSPITAL. Required, experienced Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER for long period, full residence or only when on duty. Unit has 330 Beds for the treatment of pulmonary tuberculosis in adults. Tuberculous and non-tuberculous thoracic surgery, chest clinics and mass radiography.

Apply Physician-Superintendent.

CROYDON. GENERAL HOSPITAL. (200 Beds.) Locum Tenens CONSULTANT SURGEON (full-time) required for period 9th–29th August, both dates inclusive.

Applications in writing to Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon.

CROYDON. MAYDAY HOSPITAL. (611 Beds.) Locum Tenens CONSULTANT SURGEON (full-time) required for the period 20th August–9th September, both dates inclusive.

Applications in writing to Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ASSISTANT CHEST PHYSICIAN (whole-time), Peterborough and Huntingdon Chest Clinic Areas. The Consultant Chest Physician in each area has charge of beds for tuberculosis and other chest diseases and in addition to work in the chest clinics the successful candidate's duties will include work in the hospital unit (46 Beds) for chest diseases in the Peterborough area. Higher qualification and experience in chest diseases and tuberculosis necessary. Salary scale £1500–£1950.

Applications (8 copies), stating age, experience, and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 23rd July, 1956. Candidates invited to visit clinics by direct arrangement with Hospital Management Committee Secretary, Memorial Hospital, Peterborough.

LEEDS REGIONAL HOSPITAL BOARD. Locum Radiologist (9 sessions) required for duties in the Hull and East Riding areas. Appointment for period of up to 3 months commencing August.

Applications, stating age, qualifications, details of present and previous appointments with dates, together with the names and addresses of 2 referees, to the Secretary, Park-parade, Harrogate, immediately.

LIVERPOOL REGIONAL HOSPITAL BOARD. St. HELENS AND DISTRICT AREA. Applications are invited for the post of Whole-time ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer). Duties, which will be under the supervision of the Consultant Chest Physician, will include work at the chest clinics and hospitals in the area providing beds for the treatment of tuberculosis. Candidates should hold a higher degree or diploma, and should have had extensive experience in the diagnosis and treatment of diseases of the chest including tuberculosis.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 4th August, 1956.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. The UNITED LIVERPOOL HOSPITALS. Applications are invited for a joint appointment as CONSULTANT PÆDIATRIC SURGEON on maximum part-time sessions. The appointment is for 5 notional half-days per week with the Liverpool Regional Hospital Board largely at Alder Hey Children's Hospital, and 4 notional half-days per week in The United Liverpool Hospitals initially at the Royal Liverpool Children's Hospital. Candidates must possess a registrable qualification and the F.R.C.S., and have wide experience in children's surgery.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 4th August, 1956.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Additional Part-time (8 half-days weekly) CONSULTANT TRAUMATIC AND ORTHOPÆDIC SURGEON to the Ashton, Hyde and Glossop Hospital Centre (mainly at Ashton-under-Lyne General Hospital, near Manchester, 640 Beds). Wide experience and higher qualifications essential, appointee to live in area. 24th July, 1956.

(*b*) Whole-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer) to the Wigan and Leigh Hospital Centre (main laboratories at the Royal Albert Edward Infirmary, Wigan, and Leigh Infirmary). General experience essential, but special experience in bacteriology desirable. Successful candidate will work under general guidance of a Consultant. 31st July, 1956.

(*c*) Whole-time non-resident post of ASSISTANT PHYSICIAN in Geriatrics (Senior Hospital Medical Officer) to the Burnley and District Hospital Centre (mainly at Burnley General Hospital, 220 chronic sick beds). Appointee will work under general supervision of Consultant Physicians and will be required to undertake the domiciliary assessment of patients on the waiting-list and to establish close liaison with general practitioners and the Local Health Authorities. Good experience in general medicine and previous experience in care of chronic sick desirable. Appointee to live in area. 30th July, 1956.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by the dates stated.

NEWCASTLE REGIONAL HOSPITAL BOARD. Durham AND NORTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEES. Locum CONSULTANT E.N.T. SURGEON, whole-time or maximum part-time for minimum of 6 months.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, immediately.

NEWCASTLE REGIONAL HOSPITAL BOARD. Darlington HOSPITAL MANAGEMENT COMMITTEE. (Main hospital: Memorial Hospital, 307 Beds.) CONSULTANT ANÆSTHETIST whole-time or part-time for a minimum of 9 notional half-days per week.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. CONSULTANT ORAL SURGEON (whole-time or maximum part-time) required for development of Oral Service in Sunderland and adjacent areas. The scheme will operate as from 1st January, 1957.

Further particulars may be obtained from the Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, to whom applications, with names and addresses of 3 referees, should be forwarded within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Cherry KNOWLE HOSPITAL, RYHOPE, near SUNDERLAND. Locum Tenens PSYCHIATRIST (Senior Hospital Medical Officer), whole-time for 2/3 months.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, immediately.

NEWCASTLE REGIONAL HOSPITAL BOARD. Newcastle GENERAL HOSPITAL. (838 Beds.) (Population covered 388,000). SENIOR CASUALTY OFFICER (medical) whole-time. Appointee with Senior Surgical Casualty Officer will be required to undertake the work of a very busy Casualty Department subject to the supervision of the Senior General Physicians and will also have duties in connection with the medical examinations of staff. Duration of appointment not exceeding 4 years. Salary scale £1475–£2025 p.a. Appointee will be required to reside in close proximity to the Newcastle General Hospital. Resident accommodation may be available. Further particulars from Senior Administrative Medical Officer.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT E.N.T. SURGEON (2 half-days a week), Bedford General Hospital (437 Beds). Successful applicant required to live within easy reach of Bedford.

Applications before 13th August, 1956.

(2) ASSISTANT PSYCHIATRIST (whole-time), Senior Hospital Medical Officer grade, Adult Department, Hill End Hospital, St. Albans (608 Beds). Facilities also for working in neurosis centre. Encouragement given to research and to study for higher qualifications. House available or accommodation for single candidate.

Applications before 15th August, 1956.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

OXFORD REGIONAL HOSPITAL BOARD. Consultant PSYCHIATRIST (part-time, 8 sessions) for the Child Guidance Service in the Buckinghamshire Area. Duties mainly at Aylesbury and High Wycombe. 2 of the sessions will be concerned with adult psychiatry in conjunction with St. John's Hospital, Stone (805 Beds). The Buckinghamshire County Council may be prepared to offer the successful candidate an additional contract for approximately 2 sessions a week as a Preventive Psychiatrist in their Child Welfare Service on a similar salary scale.

Applications (12 copies), stating age, qualifications, experience, and the names of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 31st August, 1956.

OXFORD REGIONAL HOSPITAL BOARD. Assistant PSYCHIATRIST (Senior Hospital Medical Officer grade), whole-time, to the Pewsey Group of Mental Deficiency hospitals. Duties mainly at Bradwell Grove Hospital (320 Beds) and Cotshill Hospital (220 Beds). Married accommodation available. Candidates should hold a Diploma in Psychiatry.

Applications (10 copies), stating age, qualifications, experience, and the names of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 4th August, 1956.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens ANÆSTHETIST (Senior Hospital Medical Officer or Senior Registrar grade according to experience) required for 3 months from 1st August 1956. Main duties are at the Royal Northern Infirmary and Raigmore Hospital, Inverness.

Applications, on forms obtainable from the undersigned, should be submitted as soon as possible.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time SENIOR CASUALTY OFFICER at the Royal Alexandra Infirmary, Paisley. Salary (at age 32 and over) on the scale £1500–£50–£1950. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

AMENDED ADVERTISEMENT

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time CONSULTANT PSYCHIATRIST at Hawkhead Mental Hospital, Glasgow, with associated outpatient and other duties at the Victoria Infirmary, Glasgow. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT ANÆSTHETIST required for hospitals in Grimsby and Louth. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 4th August, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT OPHTHALMOLOGIST required with duties at Leicester Royal Infirmary and associated clinics. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 4th August, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR CASUALTY OFFICER required at the Royal Infirmary, Doncaster. Salary within the range of £1575–£2025. Tenure for a period not exceeding 4 years.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 4th August, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST for Derbyshire Royal Infirmary to work under the direction of the Consultant Radiologist-in-charge. Candidates should possess a Diploma in Radiology. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 11th August, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Part-time CONSULTANT GENERAL SURGEON for 8 notional half-days per week, required for the Wharncliffe and City General Hospitals, Sheffield.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 11th August.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a Locum Tenens ANÆSTHETIST for 9 sessions weekly for the Portsmouth Group of hospitals from 1st August to 31st October, 1956, inclusive. The appointment and remuneration will be in accordance with the terms and conditions of service of hospital medical staff.

Applications, giving qualifications and experience, and the names and addresses of 3 referees, to the Area Secretary, Highcroft, Romsey-road, Winchester, Hants, by 23rd July, 1956.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer) based at Pontllanfraith Chest Clinic, Pontllanfraith, near Blackwood, Mon., to serve Rhymney and Sirhowy Valleys Hospital Management Committee area. Successful candidate will work under direction of Consultant Chest Physician.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT (general medicine) required West Wales Hospital Management Committee, 20th August–8th September, 1956.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT ANÆSTHETIST required, Merthyr and Aberdare Hospital Management Committee, 6th August–2nd September, 1956.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Required, Whole-time Locum Tenens RADIOLOGIST, to serve the Newport area, Mon., now available for approximately 2 months.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff, within 14 days.

Hospital Services : Junior Appointments

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER (residence optional), House Officer or Senior House Officer grade, according to experience. Vacant immediately. Not pre-registration. Not recognised for F.R.C.S.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

BERNHARD BARON MEMORIAL RESEARCH LABORATORIES. QUEEN CHARLOTTE'S MATERNITY HOSPITAL. A REGISTRAR will be required in September at the above Laboratories. Previous specialised experience is not essential. The successful candidate will receive training in serology and bacteriology, and may later assist in the research work. The post is resident.

Applications to the House Governor to the Board of Governors by 28th July on forms obtainable from 339, Goldhawk-road, London, W.6.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Surgical and Urological Department. Post-registration appointment for 6 months from 1st September, 1956. Post recognised for F.R.C.S.

Applications, with copies of 2 testimonials, to Medical Director by 28th July, 1956.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in Orthopædic and Traumatic Department. Post vacant 22nd August, 1956. Pre-registration appointment.

Applications, with copies of 2 testimonials, to Medical Director by 21st July, 1956.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT SENIOR HOUSE OFFICER required for Casualty Department. Successful candidate will work under supervision of Orthopædic Traumatic Specialist. Appointment for 6 months from 12th September, 1956.

Applications, with names of 2 referees or copies of 2 testimonials, to Medical Director by 28th July, 1956.

CITY OF LONDON MATERNITY HOSPITAL, Hanley-road, London, N.4. RESIDENT MEDICAL OFFICER (Senior House Officer), vacant 30th September, 1956. Recognised for M.R.C.O.G.

Application forms obtainable from Hospital Secretary.

FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. MEDICAL RESEARCH ASSISTANT (Registrar status) required for research project in chronic bronchitis to be carried out at the Fulham Chest Clinic and King George V Chest Hospital, Godalming, duties to commence 1st September, 1956. Post will be held for 8 months in the first instance.

Applications (5 copies) to be submitted by 27th July, 1956, on forms obtainable from, and returnable to, Group Secretary (L.94), Fulham and Kensington Hospital Management Committee, 5, Collingham-gardens, London, S.W.5.

GERMAN HOSPITAL, Dalston, E.8. (General—157 Beds.) Applications for the 6 months resident appointment of registered HOUSE SURGEON (obstetrics and gynæcology), vacant 8th August, should be sent to Group Secretary, Hackney Hospital, London, E.9, quoting GH/HSO.

GROUP LABORATORY, MILE END HOSPITAL, Bancroft-road, London, E.1. RESIDENT ASSISTANT PATHOLOGIST (Senior House Officer grade). Post vacant 11th September, 1956. Previous experience an advantage but not essential. Laboratory recognised for Diploma of Pathology and is well equipped with excellent training facilities. Post tenable for 1 year in first instance.

Applications, stating age, nationality, qualifications and experience, together with names of 2 referees, to the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1, by 18th July, 1956.

GUY'S HOSPITAL, London Bridge, S.E.1. Applications are invited for the post of REGISTRAR (middle grade) in Diagnostic Radiology at Guy's Hospital. The appointment will be for 1 year in the first instance, commencing 1st October, 1956, and applicants should hold a Diploma in Radiology.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 27th July, 1956.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited for the following 6 months resident appointments :—

(*a*) Registered OBSTETRIC HOUSE SURGEON (from 17th October).

(*b*) Pre-registration OBSTETRIC HOUSE SURGEON (second post) from 3rd September.

Posts recognised for M.R.C.O.G.

Applications to Secretary, above address, by 8th August, quoting HH/HSO.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited for the 6-month appointment from 1st August of resident Pre-registration HOUSE SURGEON (second post), recognised for F.R.C.S., and should reach the Secretary at above address, by 20th July, quoting HH/PHS/2.

HAMMERSMITH HOSPITAL AND INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY, Ducane-road, London, W.12. Whole-time NON-RESIDENT REGISTRAR (obstetrics and gynæcology) required for 1 year from 3rd September.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 23rd July.

HAMMERSMITH HOSPITAL AND INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY, Ducane-road, London, W.12. Whole-time RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology) required for 1 year from 1st October. Post recognised for M.R.C.O.G.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 23rd July.

LAMBETH HOSPITAL, Kennington, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE SURGEON falling vacant on 11th August, 1956. The successful candidate will be required to carry out a fortnight's locum duty starting on 28th July, 1956.

Application forms from Physician-Superintendent.

LEWISHAM HOSPITAL, London, S.E.13. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædics) at the above Hospital, vacant 30th July, and recognised for 6 months training for F.R.C.S. Salary £745 p.a., less £150 for residential emoluments.

Applications, stating age, qualifications and experience, with copy testimonials or names of referees, to Group Secretary, Lewisham Hospital, S.E.13.

LEWISHAM HOSPITAL, London, S.E.13. Applications are invited for a new post of SENIOR HOUSE OFFICER (urology) which is vacant immediately at the above Hospital and is tenable for 1 year. Salary £745 p.a., less £150 for residential emoluments.

Applications, stating age, qualifications and experience, with copy testimonials or names of referees, to Group Secretary, Lewisham Hospital, S.E.13.

MEMORIAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. PÆDIATRIC HOUSE PHYSICIAN (recognised for D.C.H.), vacant 20th August. Not pre-registration. The post entails routine ward and outpatient work as well as experience with neo-nates and includes general and casualty duties.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE SURGEON (pre- or post-registration). Post vacant 6th August, 1956. Post recognised by Royal College of Surgeons.

Application forms obtainable from Physician-Superintendent to be returned by 20th July, 1956, with copies of not more than 3 testimonials.

MOTHERS' HOSPITAL (Salvation Army), Clapton, E.5. (Maternity—110 Beds.) Applications are invited for the 12 months resident appointment (now vacant) of SENIOR HOUSE OFFICER (post recognised for M.R.C.O.G.), and should reach the Group Secretary, Hackney Hospital, London, E.9, within 10 days, quoting MH/SHO.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. Locum SENIOR HOUSE OFFICER for Psychiatric Unit, resident, required for period 13th August–9th September. Salary £14 10s. per week, less residence.

Apply, giving particulars of age, nationality, qualifications and experience, to Secretary of Hospital.

NORTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD. ANÆSTHETIC REGISTRAR (non-resident) for whole-time duties at hospitals in the Central Middlesex Group—mainly at Acton and Willesden General Hospitals. Officer would receive mileage allowance for the use of car. Appointment for 1 year, renewable. Hospitals may be visited by appointment.

Application forms from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, N.W.10, by 24th July, 1956.

NORTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD. Locum Tenens SENIOR REGISTRAR required West Middlesex Hospital for approximately 11 months starting 1st October, 1956. The holder of this post will be eligible to apply for the established post vacant 1st September, 1957, which is a joint appointment with St. Mary's Hospital, Paddington.

Applications, containing the usual full particulars with qualifications and names of 3 referees, should be sent to the Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 25th July, 1956.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. Locum Tenens SENIOR REGISTRAR (full-time ; non-resident) required for orthopædics, fractures and supervision of Casualty Department.

Applications, including details of age and experience, should be forwarded to the Secretary to the Committee, Paddington Group Hospital Management Committee, W.9, as soon as possible.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. Applications are invited from registered medical practitioners for the post of OBSTETRIC HOUSE SURGEON, with gynæcology and may be some general surgery. Resident. Senior House Officer grade. Vacancy from 16th August, 1956.

Applications, stating age, qualifications, and with 3 testimonials, to the House Governor, not later than 27th July, 1956.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN, for 6 months (Junior Officer grade). Vacancy from 29th July, 1956.

Applications, stating age, qualifications, and with 3 testimonials, to the House Governor, not later than 19th July, 1956.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (some anæsthetic duties), Senior House Officer grade.

Applications, stating age, qualifications, and with 3 testimonials, to the House Governor, not later than 19th July, 1956.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15. JUNIOR CASUALTY OFFICER (House Officer third post) required for 6 months commencing 16th August, 1956.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 28th July, 1956.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15. HOUSE PHYSICIAN (pre-registration) required for 6 months commencing 13th August, 1956.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 28th July, 1956.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1, and BROCKLEY HILL, STANMORE, MIDDLESEX. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (3 vacancies) for a period of 6 months. 1 to commence duties at Great Portland-street on 23rd September, 1956 ; 2 to commence duties at the Country Hospital, Stanmore, on 7th September, 1956, and 7th October, 1956, respectively.

Applications to be received by 27th July, 1956. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ROYAL NATIONAL THROAT, NOSE AND EAR HOS-PITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON (post-registration post). Applications are invited for a 6 months appointment as from 1st September, 1956, with salary and conditions as laid down for House Officers in the terms and conditions of service in the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent to the House Governor without delay.

SPRINGFIELD HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR PSYCHIATRIC REGISTRAR at the above Hospital. Previous mental hospital experience and D.P.M. essential. The Hospital is a large one and offers excellent experience in diagnosis and treatment of all forms of mental disorder including the neuroses. Every variety of modern treatment is carried out in a well-equipped treatment centre. Single accommodation is available. Candidates may visit the Hospital by arrangement.

Apply to Group Secretary, Springfield Hospital, Tooting, S.W.17, for application forms, which should be returned duly completed on or before 28th July, 1956.

SOUTH EAST REGIONAL THORACIC SURGERY UNIT (50 Beds), BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER, vacant mid-August. Recognised for F.R.C.S. 6 months appointment and may then be renewed for a further period. The Unit treats all types of chest diseases and offers opportunity for comprehensive training in thoracic surgery.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH LONDON HOSPITAL FOR WOMEN, Clapham Common, S.W.4. Applications are invited from registered Women medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (Senior House Officer grade). Appointment for 1 year. Duties include care of children's ward. Vacant 1st August, 1956.

Application forms from the Secretary.

ST. MARY'S HOSPITAL, CHILDREN'S DEPART-MENT, PRINCESS LOUISE KENSINGTON HOSPITAL FOR CHILDREN, St. Quintin-avenue, London, W.10. HOUSE OFFICERS (2) required (second or third post). Pre-registration candidates considered. Vacant 1st September, 1956, as follows :—

(*a*) Mainly medical.

(*b*) E.N.T. and casualty.

Recognised for the D.C.H.

Applications, with names of 2 referees, to undersigned not later than 28th July, 1956. A. C. YOUNG, Secretary.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited from suitably qualified practitioners for the post of NON-RESIDENT CASUALTY SURGEON. Candidates must have held an appointment as House Surgeon at this Hospital or at another hospital approved by the Board of Governors. The appointment is for a first period of 6 months, with effect from 1st September, 1956 ; remuneration to be at Senior House Officer rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 31st July, 1956.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Whole-time SENIOR REGISTRAR to the Diagnostic Radiological Department of St. Mary's Hospital. The appointment is for a first period of 12 months with effect from 1st October, 1956; remuneration to be at Senior Registrar rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 31st July, 1956.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1, AND THE NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in General Surgery, to be held for 2 years at St. Bartholomew's Hospital and for 2 years at either Queen Mary's Hospital, Stratford, or Chase Farm Hospital, Enfield. The appointment is tenable from 1st October, 1956, and is subject to annual re-election.

Applications (10 copies), together with the names of 3 referees, should be submitted to the undersigned within the next 14 days.

C. C. CARUS-WILSON, Clerk to the Governors.

St. Bartholomew's Hospital, E.C.1.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited from candidates holding a Diploma in Radiology for a post of Whole-time SENIOR REGISTRAR in the Diagnostic X-ray Department, tenable for 4 years subject to annual re-election.

Applications, with the names of 3 referees, should be submitted to the undersigned as soon as possible, and in any case not later than Monday, 23rd July, 1956.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. CLEMENT'S HOSPITAL, London, E.3. Bow Group HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (not pre-registration) for general medical wards.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be sent to the Hospital Secretary, St. Clement's Hospital, 2A, Bow-road, London, E.3.

ST. GILES' HOSPITAL, Camberwell, S.E.5. Applications invited for appointment as HOUSE OFFICER (general surgical with some E.N.T. and casualty duties).

Apply to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, with details of age, qualifications and copy testimonials by 24th July.

TAVISTOCK CLINIC, 2-4, Beaumont-street, London, W.1. Applications are invited to fill the post of SENIOR REGISTRAR in Psychiatry (whole-time). Applicants must have a good general experience in psychiatry and preference will be given to candidates possessing D.P.M. and who have had or are having personal analytical training.

Application forms obtainable from, and returnable to, Secretary to Committee, Paddington Group Hospital Management Committee, by 31st July, 1956.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of MEDICAL REGISTRAR for 1 year in the first instance from 1st October, 1956. Preference will be given to candidates holding higher qualifications.

Applications, with the names of 2 referees, to Administrator and Secretary by 19th July, 1956.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of REGISTRAR in the Pædiatric Department for 1 year in the first instance. Applicants should have held at least 1 pædiatric appointment.

Applications, with the names of 2 referees, to the Administrator and Secretary by 23rd July, 1956.

WEST HAM GROUP HOSPITAL MANAGEMENT COMMITTEE, Stratford, London, E.15. ANÆSTHETISTS (resident: Senior House Officer grade) for 12 months commencing as soon as possible. 6 months at Queen Mary's Hospital for the East End and 6 months at East Ham Memorial Hospital. Combined posts recognised for F.F.A.R.C.S.

Applications, with names of 3 referees, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 21st July, 1956.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of REGISTRAR to Radiotherapy Department for 1 year in first instance to start mid-September. Preference given to candidates holding F.R.C.S. or M.R.C.P. Experience in general medicine or surgery in Registrar grade an advantage. Knowledge of radiotherapy not essential.

Applications (7 copies), naming 2 referees, to House Governor by 28th July.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the post of Pre-registration HOUSE PHYSICIAN (general medicine) which becomes vacant 1st August, 1956.

Application forms from the Hospital Secretary to be returned by 23rd July, 1956.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited from fully registered medical practitioners for the post of HOUSE SURGEON (Orthopædic Department). Post recognised for the F.R.C.S. and vacant mid-August.

Application forms from the Hospital Secretary to be returned by 23rd July, 1956.

ALTON GENERAL HOSPITAL, Alton. (136 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN (Senior House Officer grade). Candidates should have some experience of anæsthetics. Useful experience can be obtained in general medicine and anæsthetics. The appointment is for 6 months in the first instance. Vacant 20th July.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to Group Secretary, Winchester Group Hospital Management Committee, Royal Hampshire County Hospital, Winchester.

ACCRINGTON. VICTORIA HOSPITAL. (114 Beds.) HOUSE SURGEON required for 9th August, 1956. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Applications to Secretary, Blackburn and District Hospital Management Committee, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for general medical and surgical duties. 6 months appointment, vacant 1st September, 1956, not suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON (Male) for general surgical duties. 6 months appointment, vacant 5th September, 1956. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BARNSLEY. BECKETT HOSPITAL. Applications are invited from registered medical practitioners, either sex, for the post of SENIOR HOUSE OFFICER (medicine) now vacant at the Beckett Hospital. This is a post offering excellent experience in a busy well-equipped hospital, of 209 Beds with a large Outpatient Department and usual ancillary services. Salary £745 p.a.

Applications, giving full particulars, should be sent to the Secretary, Barnsley Hospital Management Committee, 33, Gawber-road, Barnsley.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration). Post vacant mid-July.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BARRY ACCIDENT AND SURGICAL HOSPITAL. CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required immediately at above Hospital. Staffed by whole-time Consultant Surgeon and Senior Casualty Officer. Excellent experience given in general surgery.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

BATH. ROYAL NATIONAL HOSPITAL FOR RHEU-MATIC DISEASES. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN (Senior House Officer grade) at the above Hospital, attached to which is the Rheumatic Research Unit of the South-Western and Oxford Regions. The Hospital is recognised for Part II of the Diploma in Physical Medicine.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to Group Secretary, Bath Hospital Management Committee, Manor Hospital, Combe Park, Bath.

BEDFORD GENERAL HOSPITAL, Bedford. (439 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR, vacant 1st October; appointment for 1 year, renewable for second year. Hospital may be visited by writing to Senior Physician.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory with attendance at Branch Laboratory, Driffield. Offers experience all branches of pathology. Salary £745.

Detailed applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Married accommodation available. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S. Vacant now.

Apply Group Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **St. Margaret's Group 4, Gt. Barr Park, Birmingham, 22a**

REGISTRAR in M.D. Duties at St. Margaret's Hospital (1470 Beds). Experience specialty/high qualifications desirable. Hospital recognised for D.P.M. Resident/non-resident.

(2) **Birmingham (Sanatoria) Group, Yardley Green Hospital, Birmingham, 9**

REGISTRAR (chest diseases), for Yardley Green Hospital (417 Beds), Birmingham Chest Clinic. To complete clinical team for tuberculous beds and observation ward for non-tuberculous chest conditions: active bronchoscopy clinic: developing respiratory function unit. Extensive chest clinic work. Association with general medical work can be arranged.

(3) **Birmingham (Selly Oak) Group 25, Oak Tree-lane, Birmingham, 29**

REGISTRAR (pathology), vacant September at Birmingham Accident Hospital. Previous experience essential. Recognised (12 months) for Diploma in Pathology. Further details from Consultant Pathologist.

(4) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

REGISTRAR (obstetrics and gynæcology). Duties at City General and Limes Maternity Hospital (Obstetrics 100 Beds, Gynæcology 40 Beds). Experience specialty essential. Resident/non-resident. Recognised for M.R.C.O.G./D.Obst.R.C.O.G.

Application forms from Group Secretaries, to be returned before 23rd July, 1956.

BIRMINGHAM (near). MARSTON GREEN MATERNITY HOSPITAL, Berwicks-lane, MARSTON GREEN, near BIRMINGHAM. RESIDENT SENIOR HOUSE OFFICER in Pædiatrics required for 6 months or 1 year from 1st August. (The latter to be recognised for D.C.H.) Duties in Premature Baby Unit (12 Cots), in Neonatal Department at above Hospital (121 Beds), and in Neonatal and Children's Department at neighbouring hospitals. Previous pædiatric or obstetric experience desirable.

Detailed applications to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) HOUSE SURGEON required (recognised for pre-registration and F.R.C.S.). Unit of approximately 85 adult and children's general surgical beds under the control of 2 Consultant Surgeons.

Detailed applications, with copies of 3 recent testimonials, to Group Secretary.

BIRMINGHAM. GROUP 25 SELLY OAK HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Pathology, resident. Duties in emergency clinical pathology. Training in general pathology. Previous laboratory experience not necessary. Residential charge £167 p.a.

Details from Pathologist, Selly Oak Hospital, Birmingham, 29.

BIRMINGHAM, 15. ROYAL ORTHOPÆDIC HOSPITAL. Recognised by Royal College of Surgeons. 336 Beds for long and short-term orthopædic cases (non-traumatic) and extensive outpatient services. SENIOR HOUSE OFFICER. Registered medical practitioner preferably with orthopædic experience. Residential charge £190 p.a.

Applications, with testimonials or names of referees, to Administrator.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of SURGICAL REGISTRAR (non-resident), vacant 1st September, 1956. Excellent opportunities exist for performance of pædiatric surgery in close association with the Consultant Surgeons of the Teaching Hospital. Preference will be given to candidates holding a higher qualification. Residence in the Hospital will be required when the Resident Surgical Officer is absent.

Forms of application may be obtained from the House Governor, The Children's Hospital, Ladywood-road, Birmingham, 16, and should be returned not later than 25th July.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade). The post offers wide experience in clinical pathology in a Teaching Hospital laboratory. The appointment is tenable for 12 months from 1st October, 1956.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) CASUALTY HOUSE SURGEON (1 of 3). Duties include work in Orthopædic and Traumatic Unit. Vacant 31st July. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (542 staffed beds, expanding.) Applications are invited for SENIOR HOUSE OFFICER posts in the Regional Department of Neurosurgery. Vacancies will arise mid-August and at the end of September next. These posts offer useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." 2 referees required.

BURTON UPON TRENT GENERAL HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER (orthopædic) required at the above Hospital as from 1st August, 1956. Duties include supervision of Casualty House Officer.

Applications to Group Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Casualty and Orthopædics which will become vacant on 31st July, 1956. This post is recognised for the F.R.C.S.

Applications, stating details of experience, qualifications and names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (pathology).

Apply, stating age, qualifications, experience, nationality, and names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. Applications are invited for the following resident posts (pre- or post-registration appointments) for the 6 months commencing 1st August, 1956 :—

1 GYNÆCOLOGICAL HOUSE OFFICER (post recognised for M.R.C.O.G.).

2 ORTHOPÆDIC HOUSE OFFICERS.

Applications, stating age, qualifications, and any previous experience, together with the names of 2 referees, should be submitted to the Group Medical Superintendent, Law Hospital, Carluke, Lanarkshire.

CARDIFF. GLAN ELY HOSPITAL, Fairwater, Cardiff. (240 Beds.) SENIOR HOUSE OFFICER (resident) required at above Hospital for treatment of pulmonary (Thoracic Unit) and all forms of non-pulmonary tuberculosis.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required 1st August, 1956. Appointment recognised for M.R.C.O.G.

Further particulars and form of application from Group Secretary, 44, Cathedral-road, Cardiff.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (188 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of RESIDENT HOUSE OFFICER (surgical) which will become vacant on 8th August next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. SENIOR RADIOLOGICAL REGISTRAR. Post vacant 1st October. Candidates may visit the Hospital by prior arrangement with the Director of Radiology (Tel. : Fairlands 4343—Ext. 37).

Forms of application, returnable by 28th July, obtainable from the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Locum MEDICAL REGISTRAR for a few weeks from 20th August.

Applications, with names of 2 referees, to Secretary by 25th July.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House SURGEON for 6 months from 14th August. Recognised Pre-registration Service.

Apply, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to Secretary by 24th July. Interviews 1st August.

CHELMSFORD HOSPITALS. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) to large surgical units, for a period of 12 months.

Applications, stating age, qualifications and experience, with recent testimonials, should be sent to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) SENIOR HOUSE OFFICER to the Genito-Urinary Surgeon required from 2nd August, 1956. Post recognised for F.R.C.S. Salary in accordance with terms and conditions of National Health Service.

Applications, with names and addresses of 2 referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, immediately.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RADIOLOGY REGISTRAR. Applications are invited for this appointment in Registrar grade (National Health Service conditions, &c.), £850 p.a. first year and £965 second year. Duties at Royal West Sussex, St. Richards and Graylingwell (Mental) Hospitals, Chichester, and Bognor War Memorial Hospital (General Practitioners have direct reference to 2 of these). The hospitals may be visited by appointment with the Consultant Radiologist.

Forms of application from Group Secretary, 174, Broyle-road, Chichester, Sussex, to be returned by 31st July. Canvassing disqualifies.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester (19 gynæcological beds), **Colchester Maternity Hospital** (22 obstetric beds)

HOUSE OFFICER (Male or Female), obstetric and gynæcological, first, second, third, or pre-registration post ; tenable for 6 months.

Black Notley Hospital, Braintree (516 Beds)

Posts for HOUSE SURGEON AND HOUSE PHYSICIAN. The successful applicant will serve 6 months as House Surgeon followed by 6 months as House Physician. First, second, third, or pre-registration posts. Surgical post includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Medical post includes duties in medical and pædiatric wards.

Essex County Hospital, Colchester (188 Beds)

HOUSE OFFICER (surgical), first, second, third, or pre-registration post, tenable for 6 months.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DEVIZES, WILTSHIRE. ROUNDWAY HOSPITAL. (For Nervous and Mental Diseases—1334 Beds.) Applications are invited for the appointment of a JUNIOR HOSPITAL MEDICAL OFFICER for duty at the above Mental Hospital. All forms of modern treatment available, including Insulin Unit and outpatient clinics at 3 General Hospitals. Salary £775 p.a., rising by £50 to £1075 p.a. Accommodation for a single man for which £150 p.a. will be charged, or furnished house for a married man available at a rent of £3 per week plus rates.

Applications, giving names and addresses of 2 referees, to the Medical Superintendent as soon as possible.

DONCASTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER in the Orthopædic Department.

Applications to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (casualty). Post now vacant.

SENIOR HOUSE OFFICER (anæsthetics). Post now vacant.

Apply, Group Secretary, Guest Hospital, Dudley.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House SURGEON (pre-registration) or SENIOR HOUSE OFFICER (general surgery), vacant immediately.

Apply, stating full details with copies of 2 recent testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House PHYSICIAN (pre-registration), vacant 23rd July, 1956.

Apply, with copies of 2 recent testimonials, to Secretary.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. (1) SURGICAL REGISTRAR, Great Yarmouth and Gorleston Hospital (Norfolk and Norwich Group). Post recognised for F.R.C.S. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with the Hospital Secretary.

(2) REGISTRAR in Chest Diseases, Ipswich Hospital Group. Main duties at Nayland Hospital, near Colchester (124 Beds for tuberculosis and other pulmonary diseases), and Foxhall Hospital, Ipswich (102 Beds for chest diseases), where there is a Thoracic Surgical Unit. Other duties at Ipswich Chest Clinic. Furnished married quarters available. Good experience and facilities for doctor with special interest in chest diseases and reading for higher qualification. Appointment for 1 year, renewable for second year. Candidates invited to visit hospitals by direct arrangement with Physician-Superintendent, Foxhall Hospital.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 23rd July, 1956.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. (1) SURGICAL REGISTRAR (casualty), Peterborough Memorial Hospital (150 Beds). 6 months of tenure recognised for F.R.C.S. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with the Hospital Secretary.

(2) MEDICAL REGISTRAR, United Norwich Hospitals. Ward duties at West Norwich Hospital and Norwich Isolation Hospital and outpatient clinics at Norfolk and Norwich Hospital. Post provides wide experience in general medicine. Appointment for 1 year, renewable for second year. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital, Norwich.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 30th July, 1956.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (651 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Pathology for duties mainly in the Hæmatology Department. Hospital may be visited by direct arrangement with the Medical Director.

Application forms obtainable from, and returnable to, the Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 24th July, 1956.

EDINBURGH CITY HOSPITAL. Junior Hospital Medical OFFICER (infectious diseases). Applications are invited for this post which is resident and should be sent with particulars of age, qualifications, experience and names of 2 referees, to the Secretary, Board's Office, City Hospital, Edinburgh.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology) required 1st September. 12 months appointment. Post recognised in obstetrics by the College for M.R.C.O.G. and D.Obst.R.C.O.G. purposes. Candidates may visit Hospital by appointment with Consultant concerned.

Applications, stating age, qualifications and experience, with copies of 3 recent testimonials, should be sent by 28th July to Group Secretary at above address.

EXETER. DIGBY-WONFORD HOSPITAL. (577 (mental) Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required. Previous psychiatric experience advisable, but not essential if candidate has good general experience. Facilities for study for D.P.M. Salary scale £775–£50–£1075. Small flat available for single or married officer, at Digby Hospital, but unsuitable for children. Whitley Council terms and conditions of service.

Applications, giving age, nationality, qualifications and experience, with names of 2 referees, to Group Secretary, Devon Mental Hospital Management Committee, Exminster Hospital, near Exeter, as soon as possible.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. Applications are invited from registered medical practitioners, Male and Female, for the appointment of SENIOR HOUSE OFFICER in Clinical Pathology (resident), vacant now. The successful candidate will be responsible for emergency pathological and blood transfusion duties, and will work, under the Area Pathologist, in different branches of clinical pathology.

Applications, with names of 2 referees, to the Hospital Secretary.

FAREHAM. KNOWLE GROUP HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER to the above Group, comprising Mental Hospitals at Fareham (Hants) and Salisbury (Wilts). All forms of modern treatment are undertaken and previous psychiatric experience is not essential. There is a house available at a reasonable rental for a married officer. Terms and conditions of service will be as approved for hospital medical staff employed in the National Health Service. Salary £775–£50–£1075 p.a.

Applications should be sent without delay to the Physician-Superintendent, Knowle Hospital, Fareham, Hants.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. HOUSE PHYSICIAN required. Post vacant 1st August, 1956. The post is a pre-registration post at a salary of £425, £475, or £525 p.a., according to experience, less £125 p.a. for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications, and experience, with names of 2 referees, to Hospital Secretary.

GLASGOW. VICTORIA INFIRMARY. Senior House OFFICER (anæsthetics). Non-resident post recognised for F.F.A.R.C.S. and D.A.

Applications, with names of 2 referees, to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1.

GLOUCESTER. HORTON ROAD AND CONEY HILL HOSPITALS. (1450 Beds.) Applications invited for the appointment of 2 JUNIOR HOSPITAL MEDICAL OFFICERS. Hospital serves the North Gloucestershire Clinical Area including Gloucester, Cheltenham, Stroud and Forest of Dean. High admission-rate (800). All modern methods of treatment. New units provided for treatment of neurotics and alcoholics. Expanding outpatient services, long-stay annexes and social clubs. Encouragement and opportunity for study. Salary and conditions Whitley Council. Single accommodation available. Married accommodation a possibility.

Applications, with names of 3 referees, to Medical Superintendent within 14 days.

GRIMSBY GROUP OF HOSPITALS. Sheffield Regional HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (obstetrics and gynæcology) required. Post vacant 1st September. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 23rd July, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER for ophthalmology and neurology. Resident accommodation available. The post is tenable for 6 months and renewable. Whitley Council terms. Recognised for both F.R.C.S. and D.O. examinations.

Apply as soon as possible, with copies of 3 testimonials, to the Hospital Secretary.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER required for E.N.T. Department. Post is recognised for the D.L.O. examination.

Applications, with copies of 3 testimonials, should be sent as soon as possible to the Hospital Secretary.

HAREFIELD HOSPITAL, Harefield, Middlesex. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR required at above Hospital. Previous experience in general medicine and in the treatment of tuberculosis essential. Hospital has approximately 450 Beds for the treatment of tuberculosis in all its forms, a non-tuberculous Thoracic Surgical Unit of 100 Beds and 100 general medical and surgical beds. Successful candidate will be required to work on wards for the treatment of tuberculosis in women and children and on an observation ward for the diagnosis of diseases of the chest. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 24th July, 1956.

HASTINGS AND ST. LEONARDS. BUCHANAN HOS-PITAL. (94 Beds,) SENIOR HOUSE OFFICER for Urology. Post vacant approximately 8th August, recognised for F.R.C.S. Good married quarters available if required.

Apply to Hospital Administrator giving names of 3 referees.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic). Post vacant 20th August, 1956.

Apply to Hospital Administrator.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of RESIDENT HOUSE OFFICER (surgical) which will become vacant on 1st August next. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HEMEL HEMPSTEAD. WEST HERTS AND ST. PAUL'S HOSPITALS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR (resident) required at above Hospitals. Hospitals may be visited by direct appointment. Post vacant immediately.

Application form obtainable from, and returnable to, Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after the appearance of this advertisement.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general) (first, second, or third post). To commence 18th July, 1956. Pre-registration post; recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

HILLINGDON HOSPITAL, Uxbridge. (621 Beds.) REGISTRAR required in Department of Anæsthetics. Post recognised for F.F.A.R.C.S. Resident or non-resident. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to, Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Pield Heath-road, Hillingdon, Middlesex, by 31st July.

HOVE GENERAL HOSPITAL, Sussex. (75 Beds. 3 Resi-dent Medical Officers.) Pre-registration SECOND SURGEON AND CASUALTY OFFICER required mid-August. (Post recognised for F.R.C.S.) Salary £425–£525, less £125 p.a. for residential emoluments.

Applications, stating age, qualifications, full details of experience, together with names and addresses of 2 referees, to the Administrative Officer.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. RESIDENT HOUSE PHYSICIAN required 2nd August, 1956. Recognised as pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator as soon as possible.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident CASUALTY OFFICER (House Surgeon or Senior House Officer according to experience) for duty with the Accident Service and as Orthopædic House Surgeon required for 6 months in the first instance from 1st August, 1956. Recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent immediately to the Medical Administrator, Lister Hospital, Hitchin.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HOUSE SURGEON required to commence duties immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary,
Huddersfield Hospital Management Committee.

The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) Applications are invited for the post of CASUALTY OFFICER. The post, which is resident, is graded Junior Hospital Medical Officer and is recognised under the Fellowship regulations. Duties terminate at 7 P.M. daily with 1 night weekly on call.

Applications for the appointment, which will be vacant on 1st September, 1956, should be accompanied by copies of 3 recent testimonials and addressed to—

H. J. JOHNSON, Group Secretary.

The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN, to commence duties on 21st August, 1956. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE SURGEON (recognised for the F.R.C.S. examinations). There are 69 general surgical beds and some supervision is required of 17 gynæcological beds. Salary £745, less emoluments. Post vacant early August.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration post), resident, and tenable for 6 months. Vacant 1st August.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical), now vacant. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

IPSWICH AND EAST SUFFOLK HOSPITAL. Heath ROAD WING. (274 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical). The post, which is normally of 1 years duration, offers opportunity of study for higher examinations.

Applications, stating age, nationality, experience, &c., together with 3 recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL, Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Resident Anæsthetist). The post, which becomes vacant on 20th August, 1956, and is normally of 1 years duration, is recognised for the D.A. and the F.F.A.R.C.S examinations.

Applications, stating age and nationality, together with recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. (1147 Beds—General.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PSYCHIATRIC REGISTRAR required at above Hospital. Whole-time, non-resident. Recognised D.P.M. (England and R.M.P.A.). Candidates should have special interest in psychotherapy. Psycho-analytical training an advantage. Candidates may visit Hospital by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 24th July, 1956.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. Applications invited from local general practitioners for appointment as CLINICAL ASSISTANT. Appointment will be for a period of 1 year and will entail attendance at 2 sessions (normally 3½ hours each) per week in dermatology. Remuneration at the rate of £350 p.a.

Applications, with personal particulars, qualifications and experience, and the names of 2 referees, to the Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 23rd July, 1956.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. House OFFICER required for Geriatric Unit. Resident. Vacant 10th September. Post offers excellent experience in general medicine.

Applications, stating age, nationality, qualifications, and experience with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 24th July.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston UPON THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the post of Locum SENIOR HOUSE OFFICER (orthopædic and casualty) for the periods 28th July, 1956–11th August, 1956, and 17th September, 1956–30th September, 1956, both periods inclusive. The post is recognised in casualty for F.R.C.S. purposes.

Applications, stating age, qualifications and experience, with 2 testimonials, should reach the Physician-Superintendent of the Hospital as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Chest Diseases

Scotton Banks Sanatorium, Knaresborough. 200 staffed beds. Visiting Staff includes Teaching Hospital Consultants. Resident.

General Medicine

Regional Rheumatism Centre, Harrogate (240 Beds) (9 sessions). Rheumatism Clinic, General Infirmary, Leeds (2 sessions). Resident Royal Bath Hospital, Harrogate.

General Surgery

Hull Royal Infirmary (80 general surgical beds) and other hospitals in the Hull A Group. Duties those of Resident Surgical Officer and includes additional duties in the Casualty Department.

Obstetrics and Gynæcology

Hospitals in the Hull A Group (64 obstetric and 74 gynæcological beds). Recognised for M.R.C.O.G. Resident.

Orthopædic Surgery

St. James's Hospital, Leeds (64 orthopædic beds), and the Public Dispensary, Leeds. Non-resident.

Psychiatry

(1) Clifton Hospital, York (1100 Beds). Resident or non-resident.

(2) Menston Hospital, near Leeds (2500 Beds). Resident.

If desired, facilities for attendance at Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 27th July.

LEEK (near). ST. EDWARD'S HOSPITAL, Cheddleton, near LEEK, STAFFS. JUNIOR HOSPITAL MEDICAL OFFICER. Previous experience not essential. This Hospital offers opportunities for gaining experience in all branches of psychiatry. Terms and conditions of service will be as approved for hospital medical staff employed in the National Health Service. Salary £775–£50–£1075. Single furnished quarters, or unfurnished house on Hospital estate available for a married man.

Applications as soon as possible to the Medical Superintendent.

LEICESTER (near). MARKFIELD HOSPITAL. (163 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR or SENIOR HOUSE OFFICER (chest diseases) required. Duties will include attendance at chest clinics associated with Hospital under supervision of the Consultant. Minor thoracic procedures are carried out and the staff closely associated with the neighbouring major Thoracic Surgical Unit. Remuneration according to status. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 23rd July, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LINCOLN. HARMSTON HALL HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (resident) required for group of mental deficiency hospitals in Lincolnshire (943 Beds). Salary scale £775–£50–£1075, with national terms and conditions of service. Travelling expenses as approved. Furnished apartment charged at £160 p.a.

Applications, with full details of age, education, qualifications, previous appointments with dates, and 2 names for reference, to be sent to the Group Secretary, Harmston Hall, Lincoln, within 10 days.

LINCOLN. COUNTY HOSPITAL. (200 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time, Male or Female, RESIDENT SURGICAL OFFICER of Registrar grade required. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 23rd July, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited from pre-registration candidates for an appointment as HOUSE PHYSICIAN for 6 months to be followed, if satisfactory, by an appointment as House Surgeon for a further 6 months.

Apply, giving full particulars, to—

R. W. HOWICK, Group Secretary.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited from pre-registration candidates for an appointment as HOUSE SURGEON for 6 months to be followed, if satisfactory, by an appointment as House Physician for a further 6 months.

Apply, giving full particulars, to—

R. W. HOWICK, Group Secretary.

LINCOLN. COUNTY HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery which is now vacant. The post is recognised for F.R.C.S.

Apply, with full particulars and references, to the Group Secretary, County Hospital, Lincoln.

LIVERPOOL. FAZAKERLEY GROUP OF HOSPITALS MANAGEMENT COMMITTEE. AINTREE HOSPITAL, LIVERPOOL, 9. Applications are invited from registered medical practitioners for post of RESIDENT SENIOR HOUSE OFFICER (surgical). The Hospital is for the treatment of pulmonary and non-pulmonary tuberculosis, and is a main centre for thoracic surgery and has an Orthopædic Department. Salary will be in accordance with terms and conditions of service for hospital medical staff.

Applications, endorsed Resident Senior House Officer, to be submitted immediately to the Physician-Superintendent.

LIVERPOOL, 6. NEWSHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (dermatology), resident or non-resident. The post is now vacant and is tenable for 12 months. The Dermatological Department has an outpatient clinic dealing with approximately 50,000 attendances annually and 170 Beds are available for inpatient treatment. The successful candidate may be required to devote a portion of time to medical work. Salary £745 p.a., less £130 p.a. if resident.

Applications to the Physician-Superintendent as soon as possible.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. SENIOR HOUSE OFFICER required for Accident Service, including duties in the Hand Infection Unit. Vacant 1st August, 1956. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to the Secretary by 17th July.

LUTON AND DUNSTABLE HOSPITAL, Dunstable-road, LUTON. (250 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Surgery (resident) at above Hospital and associated units. Applications invited from Senior Registrars who have completed, or are about to complete their training and are awaiting appointment to consultant posts. Tenure of the appointment restricted to 2 years Hospital may be visited by direct appointment.

Application forms obtainable from the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, and returnable by 23rd July, 1956.

LUTON AND DUNSTABLE HOSPITAL. (250 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident or non-resident) required at above Hospital and associated Units (134 Beds). Post vacant 1st September, 1956. The Hospital may be visited by direct appointment.

Application forms obtainable from the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, and returnable by 31st July, 1956.

MAIDENHEAD HOSPITAL, Berkshire. Applications invited for post of HOUSE SURGEON, vacant now. Preference given to persons seeking a pre-registration post.

Applications, stating age, nationality and qualifications with names of 3 referees, to Secretary.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant 1st July, 1956. Salary at the rate of £425, £475 or £525 according to experience. A deduction at the rate of £125 a year is made for board and lodging and other services provided.

Applications should be forwarded as soon as possible to the Administrative Officer at the Hospital.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the pre-registration post of JUNIOR HOUSE OFFICER (surgical).

Applications to Group Secretary, North and Mid Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the pre-registration post of JUNIOR HOUSE OFFICER (medical).

Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER. ANCOATS HOSPITAL. Applications are invited for the post of REGISTRAR in General Surgery. Recognised for F.R.C.S.

Applications, with full details and names of 2 referees, by 23rd July, 1956, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER, 8. CRUMPSALL HOSPITAL. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer) with duties in the Department of Orthopædic Surgery. Recognised for F.R.C.S.

Applications, with full details and names of 2 referees, by 23rd July, 1956, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology. The duties will be with the Stockport and Buxton Hospital Management Committee, mainly at Stepping Hill Hospital and Stockport Infirmary, where there are 72 obstetric and 48 gynæcological beds. The post is recognised for M.R.C.O.G. and is vacant 1st October, 1956.

Applications, stating age, experience, and qualifications, together with the names of 2 referees, to be forwarded to—

H. G. PRICE, Group Secretary.

59B, Shaw-heath, Stockport, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. BAGULEY HOSPITAL. (402 Beds.) The Board invite applications for the post of (*a*) REGISTRAR and (*b*) SENIOR HOUSE OFFICER. This Hospital is a large Thoracic Unit fully equipped for the medical and surgical treatment of tuberculosis and other chest diseases. Attached to the Hospital is a Chest Clinic. The posts offer opportunities for wide experience in medical and surgical treatment of patients suffering from tuberculosis and other diseases of the chest, together with chest clinic work. Ample scope for clinical research.

Applications, stating age, qualifications, nationality, experience, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, within 7 days of appearance of this advertisement.

MANCHESTER REGIONAL HOSPITAL BOARD. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications invited for RESIDENT SURGICAL OFFICER (Registrar grade), Hope Hospital. Previous experience in surgery essential and Diploma of F.R.C.S. desirable.

Applications, with names and addresses of 2 referees, to be sent to Group Secretary, Salford Royal Hospital, Salford, 3, before 21st July, 1956.

MANCHESTER REGIONAL HOSPITAL BOARD. ResiDENT MEDICAL OFFICER (Registrar grade) post vacant at Birch Hill Hospital, Rochdale.

Apply at once, with names and addresses of 2 referees, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER (pædiatrics) required; previous experience essential. Hospital has a Midwifery Unit of 73 Beds, and the Children's Unit comprises 10 thoracic surgery, and 26 pædiatric beds catering for other specialties. Hospital recognised for training for Diploma in Child Health. Post now vacant.

Application forms from Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) 3 HOUSE OFFICERS (general surgery) required, pre-registration. Posts recognised for F.R.C.S. examination. Posts vacant, mid-October, end October, mid-November respectively.

Application forms from Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) including casualty duties. The post is recognised by the Royal College of Surgeons for the Final F.R.C.S. examination and possession of the primary F.R.C.S. will be an advantage. The hospital is recognised by the Manchester University for the teaching of undergraduate students.

Applications, with full details, to the Group Secretary, Withington Hospital.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), which will be vacant on 14th August, 1956. Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, within 7 days of the appearance of this advertisement.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited from registered medical practitioners, Male or Female, for the post of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for a period of 6 months, vacant on 24th September, 1956. Previous hospital experience essential and pædiatric experience desirable. Duties include the care of the newborn in the Maternity Department, the care of infants in the infants' ward and work in the clinics under the charge of the Department of Child Health. Salary in accordance with national scale.

Applications, stating qualifications and experience, together with the names of 3 referees, should be sent to the undersigned not later than 21st July, 1956.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the 4 posts of HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The posts are recognised for the purpose of the M.R.C.O.G. examination. The appointment is for 6 months starting 1st October, 1956. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 31st July.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the West Kent General Hospital, and the Kent County Ophthalmic and Aural Hospital, Maidstone (total beds 254). The post, which is of Senior House Officer grade, is vacant now, and carries a salary of £745 a year, less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available, and the post is recognised for the F.F.A.R.C.S. examination.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 suitable referees, should be forwarded to the Administrative Officer, West Kent General Hospital, Maidstone.

MID GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for pre-registration and qualified medical officers for the following medical staff vacancies :—

Neath General Hospital, Neath (412 Beds)
HOUSE SURGEON.
HOUSE PHYSICIAN.

Bridgend General Hospital, Quarella-road, Bridgend (381 Beds)
HOUSE SURGEON.
HOUSE PHYSICIAN.
HOUSE SURGEON (obstetrics and gynæcology).

Appointments available 1st August, 1956.

Neath General and Bridgend General Hospitals are recognised for the Major Diplomas and approved by the General Medical Council for Pre-registration Service under Section 2 of The Medical Act, 1950.

Applications, naming 2 referees, to be addressed to the Group Secretary of the Committee, 8, Wind-street, Neath.

MORPETH, NORTHUMBERLAND. NORTHGATE AND DISTRICT HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER required. The Hospital consists of 4 units with a total of 638 Beds for mental defectives of all ages and grades. A modern unfurnished flat is available at the Burnholme Unit, Stannington, at an inclusive rental of £3 12s. 1d. per month. Salary £775–£50–£1075 p.a.

Applications, stating age, qualifications, experience and names of 2 referees, to the Medical Superintendent within 14 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of SENIOR REGISTRAR in Radiology. Applicants should have spent at least 2 years as Registrar in Diagnostic Radiology and should be in possession of the D.M.R.(Diagnostic). The appointment will be for 1 year in the first instance and will be subject to terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of SENIOR HOUSE OFFICER to the Department of Dermatology at the Royal Victoria Infirmary. The appointment is for 1 year and is subject to the terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE REGIONAL HOSPITAL BOARD. Sunderland Area Hospital Management Committee. (Population 357,699.) REGISTRAR PATHOLOGIST (whole-time), resident or non-resident, single accommodation available. Unit serves 2047 beds plus Cherry Knowle Mental Hospital (843 Beds). Good facilities offered for experience in all branches of clinical pathology. Laboratory recognised for Diploma in Pathology. Post available from 1st October, 1956.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Cherry Knowle Hospital, Ryhope. REGISTRAR PSYCHIATRIST (whole-time), resident or non-resident. Small flat available. Arrangements can be made for appointee to take necessary courses of study for the University of Durham Diploma in Psychological Medicine.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. North-Allerton Hospital Management Committee. REGISTRAR SURGEON (whole-time), resident. Friarage Hospital (340 Beds). Accommodation available. Recognised for F.R.C.S. examination.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regional Thoracic Service. REGISTRAR THORACIC SURGEON (whole-time), resident, at Regional Thoracic Centre (150 Beds), Shotley Bridge General Hospital. Work almost entirely non-tuberculosis (cardiovascular, œsophageal and pulmonary), and at associated sanatoria. Applicants must have had good experience in general surgery and a higher qualification or its equivalent. Appointment intended either for a trainee in thoracic surgery or for a general surgeon seeking special experience. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. East Cumberland Hospital Management Committee. (Main Hospital : Cumberland Infirmary, Carlisle, 335 Beds.) SENIOR REGISTRAR E.N.T. SURGEON (whole-time). Facilities will be given for appointee to visit the teaching hospital at Newcastle upon Tyne for training purposes.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regional Cancer Service. REGISTRAR RADIOTHERAPIST (whole-time), mainly at Shotley Bridge General Hospital. Single accommodat on available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics 14 Beds and gynæcology 10 Beds), with opportunity for gaining experience in general surgery, vacant 14th July, 1956. Salary £745 p.a., less emoluments.

Applications, giving age, nationality and qualifications, together with copies of 3 recent testimonials, to be addressed to the Medical Superintendent.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. Recognised D.L.O.) JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (E.N.T. and eyes) required. Resident. Post covers 23 E.N.T. and 8 eye beds. National salary scale, less £125 board-residence.

Write, quoting 2 referees, to Group Secretary, 64, Cardiff-road, Newport, Mon.

NORTH SHIELDS. PRESTON HOSPITAL. (359 Beds.) Applications are invited for the resident post of HOUSE SURGEON. Salary scale according to experience.

Applications, with names of 2 referees, to Secretary.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE SURGEON to the Radiotherapy and E.N.T. Departments, vacant 1st August, 1956. This post is recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer, by 18th July, 1956.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Locum ANÆSTHETIC REGISTRAR (resident) required from 14th August to 3rd September, 1956, inclusive.

Apply to Resident Medical Officer.

NOTTINGHAM. CITY HOSPITAL. (811 Beds. Recognised for D.Path.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (pathology) required from 1st October. Post includes duties at other hospitals in the Nottingham Group. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 23rd July, 1956, giving age, nationality qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant 1st September, 1956. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (anæsthetics) required as soon as possible. The post is recognised for the D.A., and the F.F.A.R.C.S. This is a busy general hospital giving experience in all branches of surgery.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. E.N.T. Department. A SENIOR HOUSE OFFICER (E.N.T.) required at above Hospital. This post is recognised for the D.L.O. and F.R.C.S. examinations. Salary and conditions of service in accordance with Ministry regulations. Duties to commence about 1st September.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (medical) required. Duties to commence about 31st August, 1956.

Applications, stating age, qualifications nationality and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident Pre-registration HOUSE PHYSICIAN required. Duties to commence about 27th July, 1956.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications invited for CLINICAL PATHOLOGIST (Senior House Officer grade), duties to commence on or about 21st August. Previous experience in pathology not essential. Opportunities for training in all branches of clinical pathology are afforded in a department serving over 1200 beds.

Applications, stating names and addresses of 3 referees, to be sent as soon as possible to the Group Secretary.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in E.N.T. Surgery to the Hospitals of Reading Hospital Management Committee from 19th September. Single accommodation available. The appointment will be for 1 year and eligible for extension to a second year.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 14th August, 1956.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of NON-RESIDENT REGISTRAR in Anæsthetics to the United Oxford Hospitals with effect from 13th August, 1956.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than Monday, 23rd July.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. AREA PATHOLOGICAL DEPARTMENT. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in Pathology, vacant immediately. The appointment will be for a period of 12 months, in the Area Laboratory at the South Devon and East Cornwall Hospital, Greenbank-road, Plymouth, which provides excellent modern working facilities.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent to ARTHUR R. CASH, Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Anæsthetics, vacant 1st October, 1956. Recognised for the D.A. and F.F.A.R.C.S. The appointment will be for a period of 12 months.

SENIOR HOUSE OFFICER in Casualty, vacant 1st September, 1956. Recognised for the F.R.C.S., for the Central Casualty Department.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—
ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road. HOUSE SURGEONS (pre-registration posts), 2 vacancies immediately. Recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent to—
ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Saint Mary's Hospital

SENIOR HOUSE OFFICER (gynæcology) required. The department consists of 50 Beds and offers excellent facilities for training. Recognised for M.R.C.O.G. Vacant now.

Queen Alexandra Hospital

SENIOR HOUSE OFFICER for Gynæcological Department (39 Beds), vacant now. Recognised for M.R.C.O.G.

Royal Portsmouth Hospital (Orthopædic Department—104 Beds)

HOUSE OFFICER (pre-registration), vacant now.

Queen Alexandra Hospital (78 medical beds)

HOUSE PHYSICIAN (pre-registration), vacant 30th July.

Saint Mary's Hospital (74 medical beds)

HOUSE PHYSICIANS (pre-registration), vacant 30th July (1), and 31st July (2).

Saint Mary's Hospital (130 surgical beds)

HOUSE SURGEONS (pre-registration). Posts vacant 23rd, 29th and 30th July.

Applications, stating age, experience, and qualifications, together with names of 2 referees, should be forwarded as soon as possible to E. H. HURST.
35, Grove-road South, Southsea.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of RESIDENT PÆDIATRIC REGISTRAR to the Portsmouth Group of hospitals. The holder of this appointment will be responsible for 53 pædiatric beds and will also have the oversight of newly born babies in a big maternity unit. Previous experience in diseases of children is essential and the post is recognised for the D.C.H. Duties to commence 15th August, 1956.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 23rd July, 1956. Canvassing will disqualify. Candidates may visit hospitals in the Group by arrangement with the Group Secretary.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from local registered medical practitioners for a CLINICAL ASSISTANT/ANÆSTHETIST appointment at Aberbargoed and District Hospital, Mon. The duties require attendance on 1 half-day a week for a general surgical session. Remuneration £175 p.a.

Caerphilly District Hospital, near Cardiff (226 general beds)

SENIOR HOUSE OFFICER (general surgery) and 2 Pre-registration HOUSE SURGEONS.

Tredegar General Hospital, Tredegar, Mon., near Cardiff and Newport (56 surgical beds)

Pre-registration HOUSE SURGEON. Married quarters available.

St. James Hospital, Tredegar (154 general medical, geriatric and obstetric beds)

Pre-registration OBSTETRICS HOUSE OFFICER. Married quarters available.

Apply, to Group Secretary, Central Offices, Caerphilly-road, Ystrad Mynach, Hengoed, Glamorgan, by 14th July, 1956.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEONS (3) required on 16th and 24th August and 29th September, 1956, in the General Surgical Unit at the above Hospital. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully qualified practitioners. This very active General Surgical Unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidates appointed will be attached to units of approximately 60 Beds.

Applications should be forwarded to reach the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, by 27th July, 1956.

ROMFORD. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT SENIOR HOUSE SURGEON required from 30th July, 1956. Recognised for F.R.C.S. (No married quarters available.)

Applications should be forwarded immediately to Medical Superintendent, stating also names of 2 referees.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE OFFICER (general surgery), required from 7th August, 1956. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent, stating also names of 2 referees.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for post of RESIDENT JUNIOR HOUSE SURGEON in the Area Accident and Orthopædic Department, vacant 1st August, 1956. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £125 board-residence.

Apply, stating age, qualifications with dates, nationality, present post with 1 copy of recent testimonial, to Hospital Secretary.

READING COMBINED HOSPITALS. Area Department OF OBSTETRICS AND GYNÆCOLOGY. (100 Beds.) Applications are invited from registered medical practitioners, Male and Female, for resident appointment of GYNÆCOLOGICAL HOUSE SURGEON at the Royal Berkshire Hospital, vacant immediately and tenable for 6 months. Post recognised for M.R.C.O.G.

Write, stating age and qualifications with dates, nationality, and present appointment, with a copy of 1 recent testimonial, to the Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (399 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of a SENIOR HOUSE OFFICER (anæsthetics), vacant 1st August next for a period of 1 year. Post recognised for F.F.A.R.C.S. Salary £745 p.a., less £125 for board-residence.

Write, stating age, qualifications with dates, nationality and present post together with the names of 2 referees, to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for E.N.T. Department, Royal Berkshire Hospital, Reading (40 Beds). Post recognised for D.L.O.

Applications, stating age, nationality, experience and qualifications, together with names of 2 referees, should be sent to Group Secretary, 3, Craven-road, Reading.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Pathology with primary duties in hæmatology and blood transfusion, based at Stobhill General Hospital, Glasgow.

SENIOR REGISTRAR in Ophthalmology based at the Ophthalmic Institution, Glasgow.

REGISTRAR in Radiotherapy based at the Western Infirmary, Glasgow.

REGISTRAR in Radiodiagnosis based at the Western Infirmary, Glasgow.

REGISTRAR in Radiodiagnosis based at the Victoria Infirmary, Glasgow.

REGISTRAR in Medicine based at the Royal Infirmary, Falkirk.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 28th July, 1956.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in Radiotherapy at the Royal Infirmary and Western General Hospital, Edinburgh.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 4th August.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in the Regional Pool of Anæsthetists based on the Royal Infirmary of Edinburgh. The successful candidate will be seconded for periods of duty in peripheral hospitals, details of which may be obtained on application.

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 4th August.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in E.N.T. Surgery at the Royal Infirmary of Edinburgh, vacant on 1st October, 1956.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 4th August.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Bacteriology to the Edinburgh Northern Group of hospitals, based on the Northern General Hospital, vacant on 1st October, 1956.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, 11, Drumsheugh-gardens, Edinburgh, 3, by 4th August.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in E.N.T. Surgery at the Royal Infirmary of Edinburgh.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 4th August.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (267 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 23rd July, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SALFORD, 6, LANCASHIRE. HOPE HOSPITAL. Salford HOSPITAL MANAGEMENT COMMITTEE. RESIDENT CLINICAL PATHOLOGIST required for Group Laboratory at Hope Hospital. Post vacant end of August. Ample time off for clinical work if desired.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, should be addressed to the Hospital Secretary.

SHEFFIELD NATIONAL CENTRE FOR RADIOTHERAPY. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SENIOR HOUSE OFFICER or REGISTRAR in Radiotherapy required. (Possession of D.M.R.(T.) Part I necessary to qualify for appointment as Registrar.) Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 23rd July, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications invited for the following posts :—

(*a*) NON-RESIDENT REGISTRAR or SENIOR HOUSE OFFICER in General Medicine. Grade according to qualifications and experience.

(*b*) REGISTRAR to the Department of Neurology. Post vacant 11th October. This is a large Neurological Department in a Teaching Hospital Group. Post offers wide experience and opportunities for postgraduate training and for attending postgraduate teaching in other departments.

(*c*) RESIDENT SENIOR HOUSE OFFICER in Anæsthetics.

Applications for posts (*a*) and (*b*) should give the names of 3 referees and be sent not later than 28th July to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

Applications for post (*c*) should give the names of 3 referees and be sent at once to the Superintendent, Royal Hospital, West-street, Sheffield, 1. Copy testimonials may be included.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required for post vacant 12th August. Pre-registration appointment and offers considerable experience in general acute medical work.

Applications, with names of 2 referees, to Secretary by 20th July.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. CASUALTY HOUSE OFFICER required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases. Salary on House Officer scale plus £50 p.a.

Applications, together with names of 2 referees, to Secretary.

SOUTHAMPTON CHEST HOSPITAL. (261 Beds.) SENIOR HOUSE OFFICER required from mid-August, to be responsible for Infectious Diseases Unit. The duties are such as to suit a candidate reading for higher examinations. The Unit is sited at a Hospital possessing up-to-date tuberculosis and thoracic surgical units, whilst the Southampton Group of hospitals as a whole affords excellent opportunities for study and experience in all branches of medicine.

Applications, together with copies of recent testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) RESIDENT HOUSE SURGEON required early in August. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds. Recognised for F.R.C.S.) CASUALTY OFFICER (Senior House Officer grading) required early in August.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Obstetrics and Gynæcology to fill a vacancy in the approved trainee establishment at the Canterbury and Thanet Groups of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, 11, Portland-place, W.1, not later than 28th July, 1956.

SOUTHPORT GENERAL INFIRMARY. Junior Hospital MEDICAL OFFICER (resident). Whole-time casualty post, vacant early August.

Apply, stating age, nationality, qualifications, experience and copies of 2 recent testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTH ELMSALL. WARDE-ALDAM HOSPITAL. RESIDENT SURGICAL OFFICER (Senior House Officer grade) required. Warde-Aldam Hospital is a small general hospital of 33 Beds. Flat available. Post vacant as from the end of August, 1956.

Applications as soon as possible to—

D. G. DAVIES, Secretary,
Pontefract and Castleford Hospital Management Committee.
Great Northern House, Salter-row, Pontefract.

SUTTON AND CHEAM HOSPITAL, Cotswold-road, SUTTON, SURREY. SURGICAL REGISTRAR. Post vacant mid-October. Candidates may visit Hospital by prior arrangement with Secretary (Tel. : Vig. 8691).

Forms of application, returnable by 28th July, obtainable from the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

ST. ALBANS CITY HOSPITAL. St. Albans, Hertfordshire. (384 Beds.) Locum Tenens ANÆSTHETIC REGISTRAR (resident) required for the period 13th–26th August inclusive.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS, HERTFORDSHIRE. HILL END HOSPITAL. (647 Beds. For Mental and Nervous Disorders.) Locum Tenens REGISTRAR in Psychiatry required approximately 1st August for an indefinite period.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS, HERTFORDSHIRE. HILL END HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time PSYCHIATRIC REGISTRAR required at above Hospital. Duties involve work in the mental wards and Neurosis Unit. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, by 3rd August, 1956.

STOCKPORT. STEPPING HILL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant 1st October, 1956.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire.

STOKE-ON-TRENT. HAYWOOD HOSPITAL. Resident SURGICAL OFFICER (Junior Hospital Medical Officer) required. Post vacant early August.

Applications, with full details and copy testimonials, to Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (E.N.T.) required, vacant now. Recognised F.R.C.S. and D.L.O.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) vacant now. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SUFFOLK MENTAL HOSPITALS MANAGEMENT COMMITTEE. ST. AUDRY'S HOSPITAL, MELTON, near WOODBRIDGE ; ST. CLEMENT'S HOSPITAL, Foxhall-road, IPSWICH. Applications are invited from registered medical practitioners (Men or Women) for the posts of SENIOR HOUSE OFFICERS (3) which are now vacant. These Hospitals comprising 1500 Beds, together with Outpatient Departments, electro-encephalography and medical psychology, offer extensive experience of modern psychiatric methods. The Group is recognised for D.P.M. purposes and experience is also available locally, in child psychiatry and in neurology. Accommodation is available. Salary in accordance with the national scale, as laid down in terms and conditions of service for medical and dental officers.

Applications should be made to—

Dr. I. J. DAVIES, Physician-Superintendent.
St. Audry's Hospital, Melton, near Woodbridge, Suffolk.

SUTTON. BELMONT HOSPITAL. South West Metropolitan REGIONAL HOSPITAL BOARD. Applications are invited for appointment as PSYCHIATRIC REGISTRAR at above Hospital, which is principally concerned with the treatment of neuroses and the early psychoses. There are ample opportunities for research and the Hospital, which is recognised for the D.P.M., takes an active part in teaching in association with teaching hospitals. Candidates may visit the Hospital by appointment with the Physician-Superintendent.

Application forms may be obtained from the Group Secretary, Group Office, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms (5 copies) should be returned to him within 2 weeks of the appearance of this advertisement.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 14th August. Preference given to persons seeking pre-registration post.

Applications, stating age, qualifications with dates, with copies of 2 recent testimonials, to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Locum ANÆSTHETIC REGISTRAR (resident) required 13th September–3rd October.

Applications, with copies of 2 testimonials, to Secretary, immediately.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. SENIOR HOUSE OFFICER (anæsthetics) required. Post, which is tenable for 1 year, will be resident.

Applications, with names of 2 referees, to Secretary.

TORQUAY. TORBAY HOSPITAL. (166 Beds.) Senior RESIDENT HOUSE OFFICER (anæsthetics) required as soon as possible. There is a complement of 6 Resident House Officers and the Hospital is recognised for the D.A. and for the F.F.A.R.C.S.

Applications, stating qualifications, age, nationality, with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. (166 general beds.) RESIDENT HOUSE OFFICER (surgical), Male or Female, required as soon as possible. Post recognised for F.R.C.S. and pre-registration purposes. There is a complement of 5 Resident House Officers.

Applications, stating qualifications, nationality, and age together with copy testimonials (quoting reference F.955/70), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

WINDYGATES, FIFESHIRE. CAMERON I.D. HOSPITAL. RESIDENT HOUSE PHYSICIAN required for 6 months as from 1st August. The post is recognised for Pre-registration Service. The Hospital consists of 100 infectious diseases beds and additional beds in course of transition to a Tuberculosis Unit. Salary in accordance with national scale.

Apply, with copies of 2 recent testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the vacant post of RESIDENT ANÆSTHETIST (Male or Female). Graded as Senior House Officer. The Hospital is recognised for the D.A. examination. Salary is £745 p.a., less a deduction of £130 p.a. for residential emoluments.

Applications, stating qualifications and experience, should be sent to— H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the post of RESIDENT CASUALTY OFFICER (Male or Female), now vacant. The post is graded Junior Hospital Medical Officer. Scale of salary £775–£50–£1075, less a deduction of £130 for residential emoluments. Applications will also be considered from Junior Medical Officers who would be graded House Officer or Senior House Officer at the scale appropriate to the experience of the applicant. Consideration will also be given to applicants who desire the appointment on a short-term basis. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience and qualifications should be forwarded or telephoned to—
H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.
(Tel. No. Warrington 1666.)

WARRINGTON (near). WINWICK HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (salary £775–£50–£1075) or SENIOR HOUSE OFFICER (salary £745 p.a.). Board-residence available at appropriate charge. All modern methods of treatment of mental illness and nervous disorders are available in this Hospital of 2300 Beds which is recognised for training for D.P.M. Appointment subject to terms and conditions for hospital medical and dental staffs.

Applications, with full details of qualifications, experience, &c., and names and addresses of 2 referees, to be sent to Medical Superintendent (Ref. L/247), Winwick Hospital, Warrington, as soon as possible.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (208 Beds.) ORTHOPÆDIC HOUSE SURGEON (with certain casualty duties) required. Post recognised for F.R.C.S. (Eng.) examination. Intermediate or senior post depending on experience, for Orthopædic Unit (30 Beds). The Orthopædic Service is in the charge of a Consultant and Registrar closely associated with a Postgraduate Teaching Hospital.

Applications, with copies of 2 testimonials, to the Administrator.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (208 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (pre-registration post). Salary according to National Health scale.

Applications, with copies of 2 recent testimonials, to the Administrator.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (208 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital. This is a pre-registration post and is recognised for F.R.C.S. Salary according to the National Health Service scale.

Applications, with copies of recent testimonials, to the Administrator.

WAKEFIELD. MANYGATES HOSPITAL, Barnsley-road. Applications are invited for the post of OBSTETRICAL HOUSE SURGEON at the above Hospital and annexe. This post is recognised for training for the D.Obst.R.C.O.G., and is vacant from 1st August, 1956. The terms and conditions of service are in accordance with the National Health Service Act and Regulations.

Immediate applications should be made to the Group Secretary, Hospital Management Committee No. 9, Wakefield A Group, 113, Northgate, Wakefield.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (general medicine), Caernarvon and Anglesey General Hospital, Bangor (130 Beds). Non-resident.

REGISTRAR (general surgery), Royal Alexandra Hospital, Rhyl (138 Beds). Application forms within 10 days.

REGISTRAR (general medicine), Neath General Hospital (412 Beds), may also be expected to serve other hospitals within group. Resident/non-resident.

REGISTRAR (obstetrics and gynæcology), at Neath General Hospital (412 Beds). Hospital recognised for M.R.C.O.G.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEONS (Male or Female) required for 2 resident posts vacant in August.

(*a*) Dorset County Hospital, Dorchester (111 Beds).

(*b*) Weymouth and District Hospital, Weymouth (124 Beds).

Both appointments are recognised for F.R.C.S. examination and approved for Pre-registration Service.

Applications, stating age, and qualifications, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE.

Royal Albert Edward Infirmary, Wigan

HOUSE SURGEON (pre-registration post), vacant 17th July.

Leigh Infirmary

HOUSE SURGEON (pre-registration post), vacant 29th July.

Applications, with names of 2 referees, to the Secretary, Knowsley House, Wigan.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Psychiatry (resident or non-resident) to assist Consultant Psychiatrist. Main centre—Billinge Hospital. Active Psychiatric Unit. Modern treatment. Over 300 admissions annually. Post recognised for D.P.M. Good training facilities.

Applications, with names of 2 referees, to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. (200 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery. Post vacant 1st September.

Applications to Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (313 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 27th August.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Obstetric AND GYNÆCOLOGICAL HOUSE SURGEON required, Male or Female, for post vacant 29th August. Post recognised for both M.R.C.O.G. and D.Obst.R.C.O.G. Not a pre-registration post. Successful candidate will be resident at Old Windsor Unit of Hospital. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, and copies of recent testimonials or names of 3 referees, to Secretary.

WOLVERHAMPTON GROUP.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER (Anæsthetist), vacant now. Appointment recognised for D.A. and F.F.A.R.C.S.

HOUSE OFFICER (E.N.T. Department), vacant 1st August. Also listed as pre-registration post.

Apply Secretary, with copies of testimonials.

WREXHAM. WAR MEMORIAL HOSPITAL. (230 Beds.) Applications are invited for the 2 posts of HOUSE SURGEON at the above Hospital, to commence duties on 1st August, 1956. The appointments are recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and are pre-registration posts.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

BELFAST. CLAREMONT STREET HOSPITAL FOR NERVOUS DISEASES. BELFAST HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE PHYSICIANS required at Claremont Street Hospital and 1 at the Branch Hospital, Killowen, Lisburn, for 6 months commencing 1st August, 1956. Salary £525 p.a. The Hospital is recognised by the Conjoint Board for the D.P.M. examination and takes part in undergraduate and postgraduate teaching as part of the clinical curriculum in the Queen's University of Belfast. There are 54 beds for neurological cases; a few psychoneuroses and minor affective disorders are taken. There is a close liaison between the Hospital and the Department of Neurology at the principal Teaching Hospital (Royal Victoria Hospital) and its Neurosurgical Unit.

Applications, stating age, experience, &c., together with copies of recent testimonials, should be sent to the Secretary, Claremont Street Hospital, Belfast.

NORTHERN IRELAND HOSPITALS AUTHORITY. SOUTH TYRONE HOSPITAL, DUNGANNON. Applications are invited for the post of HOUSE OFFICER (pre-registration or post-registration), at the South Tyrone Hospital, Dungannon, co. Tyrone. The salary attaching to the post will be £425 rising by half-yearly increments to £525. A charge of £125 p.a. will be made for accommodation and services provided.

Applications, stating age, qualifications and experience, and the names of 2 persons to whom application may be made for a confidential report, should be sent as soon as possible to the Secretary, South Tyrone Hospital Management Committee, Dungannon, co. Tyrone.

Public Appointments

COMMONWEALTH OF AUSTRALIA. Public Service of PAPUA AND NEW GUINEA. Vacancies. DEPARTMENT OF HEALTH.

MEDICAL OFFICER (Grade 1). (Number of vacancies.) £1922 (Aust.)–£2288 (Aust.) pa. *Note.*—Married Officers receive an additional £173 p.a.

Qualifications: British (or Australian) registration; possession of D.T.M.&H. or willingness undergo course as duty when required.

Duties: General medical duties including conducting of hospitals and prevention of disease.

Eligibility: Adult British subjects under 45 years.

Appointment: Permanent subject to satisfactory probationary period.

Leave: 3 months after each 21 months in territory; additional 3 months after each 6 years service and 6 months furlough after 20 years service.

Taxation: Income derived by residents of territory from sources within territory is not at present taxable under Commonwealth legislation.

Further Information and Application Forms: Information handbooks on the Public Service of Papua and New Guinea, other information and application forms are available from the Public Service Board Representative, Australia House, Strand, London, W.C.2.

Applications: Submit on prescribed form to Public Service Board Representative, Australia House, Strand, London, W.C.2, by 11th August, 1956.

GOVERNMENT OF TANGANYIKA. Specialist (Child Health) required for organisation and promotion of Child Health Services throughout the territory and such other related duties as may be assigned. Appointment on contract for 1 tour of 30–36 months in first instance. Subject to satisfactory service, a gratuity (taxable) will be payable at the rate of 13½% of salary drawn, excluding allowances. Salary scale £2000–£2100 a year plus cost-of-living allowance of £162 a year. Candidate from the National Health Service would be appointed on terms providing for the retention of his superannuation rights. Quarters generally available at rental of £150 a year. Free passages in both directions for Officer and wife and up to the cost of 1 adult fare for children. Taxation at local rates. Annual local leave permissible. Educational facilities available. Candidates must possess medical qualifications registrable in the United Kingdom and the M.R.C.P. or equivalent higher qualification. Special experience in child health work is necessary, and it is thought that candidates would normally have the D.C.H. though this is not essential.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/8/021).

GOVERNMENT OF BARBADOS. Bacteriologist and PATHOLOGIST required to be responsible for the services provided by the Government Bacteriological and Pathological Laboratory. Duties include:—

(*a*) Examination and reporting upon bacteriological and pathological matters including medicolegal materials submitted by Crown Law Officers, Coroners or the Commissioner of Police.

(*b*) Bacteriological and pathological research into medical and health problems.

(*c*) Advise on and supervise any other public health laboratories to be established by Government.

He would be under direction and control of the Director of Medical Services.

Candidates must possess qualifications registrable in United Kingdom with special qualifications such as M.D. in Pathology or Bacteriology or a Diploma in Bacteriology, and should be experienced in clinical pathology and all branches of laboratory work. Appointment on permanent and pensionable basis or on agreement for 3 years in first instance (in which case passage arrangements are slightly different). If appointed on agreement employers share of superannuation contributions will be paid. Salary $6720 a year (£1400). An allowance of $480 (£100) a year also paid in lieu of consultant practice and a temporary cost-of-living allowance of $156 (£32 10s.) a year. Income-tax at local rates. Free passages on appointment for Officer, wife and family up to a maximum cost of £300 (or £400 if required to travel by air) and on leave for Officer and wife at end of tour of 3½ years. Social and recreational amenities are good and climate is healthy for Europeans. Educational facilities available.

Application forms from the Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/28/08).

LUTON. BOROUGH OF LUTON. Assistant Medical OFFICER. Applications are invited for this appointment. Salary within grade £1050–£50–£1200–£55–£1475, according to qualifications and experience. Car allowance. Preference will be given to applicants possessing a Diploma in Public Health. Duties will include work in connection with School Health Services, hospital treatment of infectious diseases, and Part III Personal Health Services.

Full particulars and conditions of appointment obtainable from the undersigned. Applications to be received by 25th July, 1956.

Town Hall, Luton. A. D. HARVEY, Town Clerk.

LINDSEY COUNTY COUNCIL. Health Department. Applications are invited from fully qualified medical Women for post of ASSISTANT MEDICAL OFFICER for maternity and child welfare for Horncastle, Louth and Skegness area of Lindsey. Salary in accordance with recommendation of Medical Whitley Council for Health Services regarding salaries of Assistant Medical Officers, i.e., £1050 p.a. rising by 3 annual increments of £50 and 5 annual increments of £55 to a maximum of £1475 p.a. Possibility of furnished flat (privately owned) available in area.

Further particulars and forms of application obtainable from Dr. C. D. CORMAC, County Medical Officer, P.O. Box No. 26, County Offices, Lincoln, whom applications should reach by 23rd July.

HER MAJESTY'S OVERSEA SERVICE. Government OF BRITISH GUIANA. MEDICAL SUPERINTENDENT required to take charge of Mental Hospital at Berbice, to supervise staff, patients, revenue and expenditure and the psychiatric clinic held monthly at Georgetown. Appointment on permanent basis with pension (non-contributory). Doctors in the National Health Service may leave but retain their superannuation rights (up to 6 years) and receive on leaving oversea employment a gratuity (taxable) of 20% of the aggregate of their salary. Salary £1800 p.a. plus non-pensionable allowance of £250 p.a. in lieu of consultation fees. Private practice not permitted. Pension is 1/600th of final pensionable emoluments for each completed month of service. Income-tax at local rates. Free unfurnished quarters provided. Generous home leave. On appointment free passages for Officer, wife, and children under 18 years, not exceeding 5 persons in all. Free passages on leave for Officer and wife only. Candidates must possess medical qualifications registrable in United Kingdom, hold a Diploma in Psychological Medicine and have had at least 2 years' experience in a Mental Hospital.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/30/05).

HER MAJESTY'S OVERSEA SERVICE. Sierra Leone. MEDICAL OFFICERS required for general duties. Candidates must possess medical qualifications and have had at least 12 months postgraduate hospital experience.

Appointments may be:—

(*a*) On 3 years probation for permanent and pensionable employment with pension (non-contributory) at the rate of 1/600th of the final pensionable emoluments for each completed month of reckonable service.

(*b*) From the National Health Service. Candidates may leave the National Health Service but retain their superannuation rights up to 6 years, and receive a gratuity (taxable) of 20% of the aggregate of salary.

(*c*) Short-term contract (2 tours each of 18–24 months duration), with gratuity (taxable) of £37 10s. for each completed period of 3 months service (including leave), which is payable on satisfactory completion of appointment.

Inclusive salary scale under (*a*) and (*b*) £1098–£1956 a year, and under (*c*) £1185–£2117. Starting salary being determined by age, qualifications and experience. Quarters normally available at low rental. Return sea passages for Officer, wife, and up to 2 children under 19 years of age or an allowance in lieu if children are maintained outside Sierra Leone for the whole of the tour. Income-tax at local rates. Local leave permissible and generous home leave granted after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/15/02).

HER MAJESTY'S OVERSEA CIVIL SERVICE. Western SAMOA. SURGEON required for major general surgery in Western Samoa. Climate healthy and living conditions very pleasant.

Appointment as follows:—

(*a*) On permanent and pensionable basis to South Pacific Health Service and seconded initially for 3 years to Western Samoa; or

(*b*) On contract for 1 tour of 3 years with gratuity (taxable) on satisfactory completion of service.

Salary £(N.Z.)2100 a year. Pension (under (*a*)) of 1/600th of final pensionable emoluments for each completed month of pensionable service. Gratuity (under (*b*)) on completion of engagement of £(N.Z.)37 10s. for each completed 3 months of satisfactory service. Government quarters at rental of 10% on first £(N.Z.)1200 of salary and 3% of salary above that figure. Income-tax at local rates. Free passages on appointment for Officer, wife, and children up to the cost of 4 adult passages and on leave up to the cost of 3 adult passages. Leave, 5 days for each completed month of service. Candidates must be F.R.C.S.

Application forms from the Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/162/05).

MAURITIUS. Specialist Anæsthetist required to administer anæsthetics in hospitals under direction of the Director of Medical Services. Candidates must have qualifications registrable in United Kingdom, with experience in anæsthesia. Possession of F.F.A.R.C.S. or D.A. an advantage. Appointments on permanent basis with pension (non-contributory) or short-term contract with gratuity (taxable) of £50 for each completed 3 months service. Salary scale Rs.14,220–Rs.20,820 (£1066 10s. to £1561 10s.) a year. Temporary non-pensionable cost-of-living allowance payable of 8% of salary. Officers not allocated Government quarters will be reimbursed difference between approved rent paid for a furnished private house (subject to a maximum of Rs.300 (£22 10s.) a month), and the 10% of salary normally payable for a Government house. Officers in hotels or boarding houses regarded as paying rent for first 21 days at one half and thereafter one quarter of board and lodging charges for themselves and their wives. Income-tax at local rates. Free passages in both directions for Officer, wife, and children not exceeding 5 persons in all. Generous home leave.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/52/09).

MUNICIPAL BOARD OF MOMBASA. Applications are invited for the post of Lady MEDICAL OFFICER. Salary £1150–£45–£1375, plus cost-of-living allowance, now 10% of salary. Commencing salary commensurate with qualifications and experience. Unfurnished housing or house allowance, passages and leave in accordance with the Board's terms of service. Applicants must be registered medical practitioners with experience in midwifery. The possession of the Diploma of the Royal College of Obstetricians and Gynæcologists will be an advantage. Medical certificate of fitness required before appointment. Full particulars of the Board's terms of service on request. Personal canvassing disqualifies.

Applications should be submitted to the Town Clerk, P.O. Box 440, Mombasa, not later than 31st July, 1956.

June, 1956. A. V. RATCLIFF, Town Clerk.

GOLD COAST LOCAL CIVIL SERVICE. Applications are invited for the following posts in the Ministry of Health, Gold Coast.

RADIOLOGIST to take charge of Hospital X-ray departments and train junior staff as X-ray attendants. Candidates must possess D.M.R.D.

PATHOLOGIST to carry out routine duties of Clinical Pathologists including hæmatology, bacteriology, histopathology and biochemistry. May be required to perform post-mortem examinations and other duties in connection with forensic medicine. Candidates must have had at least 2 years full-time approved laboratory experience.

MEDICAL OFFICERS for work in Medical Field Units. Possession of D.T.M.&H. and previous tropical experience desirable but not essential. Selected candidates may be required to do D.T.M.&H. course before leaving for Gold Coast in which case fees and an allowance will be paid.

Work consists of control of endemic and epidemic disease by field survey and mass treatment. Medical officers are normally in sole charge of a Unit working in an area of many hundreds of square miles and consisting of some 50 lay assistants under direct supervision. A house is provided at every Field Unit headquarters but considerable travelling is necessary. Most travelling is done in officer's own car for which generous maintenance and mileage allowances paid. As Field Units operate almost exclusively in remote areas with few social amenities officers of an adventurous spirit who can make their own leisure amusements are best suited. Work offers great scope for field research into largely unknown epidemiological problems and is likely to appeal to men with an inclination towards preventive medicine who enjoy active life.

Appointment is to G.C. Local Civil Service and may be :

(*a*) Contract for 2 tours of duty of 18–24 months with gratuity (taxable) of £12 10*s.* for each completed month of service.

(*b*) 3 years probation for permanent and pensionable employment. Pension (non-contributory) is at rate of 1/600th of final pensionable emoluments for each completed month of service; or

(*c*) Doctors in the National Health Service may leave the National Health Service but retain their superannuation rights while in the Gold Coast (up to 6 years) and receive a gratuity (taxable) of 20 % of their Gold Coast salary.

Salary under (*a*) from £1330 to £2310 a year and under (*b*) and (*c*) £1055–£1850 a year, starting point being determined by qualifications and experience. Quarters when available at rental not exceeding £150 a year. Income-tax at local rates. Free passages for Officer, wife, and up to 3 children under 13 years of age. Annual local leave permissible and generous home leave granted after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/13/010).

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT EDUCATION COMMITTEE. Applications are invited for the post of DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Salary scale : £1415–£1830 p.a. Contributory superannuation. Candidates should have a Diploma in Public Health and considerable experience as a School Medical Officer. The appointment is terminable by 3 months notice on either side. The successful candidate will be required to pass a medical examination.

Application forms are obtainable from the undersigned, P.O. Box No. 23, Town Hall, Hanley, Stoke-on-Trent, to whom they should be returned by 14th August, 1956.

H. DIBDEN, Chief Education Officer.

TRISTAN DA CUNHA. Doctor required for general medical duties on South Atlantic Island of Tristan da Cunha. Appointment would be on agreement for 2 years. Salary £1200 a year. Free quarters provided equipped with heavy furniture, for which a small rental may be charged. Free passages provided for Officer, wife, and up to 3 children to and from the Island. Generous home leave granted after tour. Private practice is not permitted. Special importance will be attached to suitability of personal qualities for service in this small, remote but distinctive community. Candidates must possess medical qualifications registrable in the United Kingdom.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/170/02).

AMENDED ADVERTISEMENT

WALSALL. COUNTY BOROUGH OF WALSALL. Applications are invited from registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH at a salary of £1050 p.a., rising by annual increments to £1475 p.a. The commencing salary will be decided according to qualifications and experience. Possession of the D.P.H. or D.C.H. will be considered an advantage. Unfurnished flat available if required.

Further particulars and application forms may be obtained from W. STALEY BROOKES, Town Clerk.

Council House, Walsall.

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 3 years, on termination of which a gratuity of £450 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, to be medically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
HULL	YORK	28TH JULY, 1956
YALDING ..	KENT	28TH JULY, 1956

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

ILFORD, ESSEX. Applications invited for retirement VACANCY (urban). List at present approximately 2000. Surgery accommodation may be available. Apply on Form E.C.16A not later than first post 26th July, 1956, to—

E. BERGDAHL, Essex Executive Council.

131/3, Fillebrook-road, Leytonstone, E.11.

PORTSMOUTH, HAMPSHIRE. Applications invited for VACANCY, due to resignation, in Central Portsmouth. "Intermediate" area. List at present 1950. Surgery available for purchase. Successful applicant would be required to take over practice 1st October, 1956. Apply on Form E.C.16A to the undersigned not later than 30th July.

A. R. GODDARD, Clerk, Portsmouth Executive Council.

66/74, Pearl Buildings, Commercial-road, Portsmouth.

PRESTATYN. Applications are invited for Vacancy (urban) caused by resignation. List approximately 1140. Residence and surgery available. Applications on Form E.C.16A, to the undermentioned before 21st July, 1956.

TUDOR WILLIAMS, F.C.I.I.,

Clerk of the Denbighshire and Flintshire Executive Council.

11, Grosvenor-road, Wrexham.

Hospital Services : Non-Medical Appointments

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.5. Applications are invited from persons holding a degree in Biochemistry or Physiology for the post of BIOLOGIST to the Hospital and Medical School. Salary within the range £500–£50–£700 ; F.S.S.U. and family allowances.

Further particulars may be obtained from, and applications, giving full particulars of qualifications and experience, should be sent to, the Secretary not later than 30th July.

Miscellaneous

Medical Department Executive. Prominent Pharmaceutical House invite applications for the position of Medical Department Executive. Duties include the training and supervision of medical propaganda staff, compiling and editing of medical literature, and the initiation of clinical trials. Medical qualifications an advantage but not essential if applicant has appropriate background. Applications, which will be treated in the strictest confidence, should give full details of qualifications, experience, and indication of emoluments expected.—Address, No. 234, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Medical Officer required by large Oil Company for service initially based on London but entailing overseas tours of duty and eventually for permanent service in the Middle East. Preference will be given to bachelors under 37 with overseas experience and some knowledge of tropical work. Substantial salary, pension scheme.—Write, quoting No. 646, to : Box No. 167, c/o CHARLES BARKER & SONS LTD., Gateway House, London, E.C.4.

Consultant Radiologist required for service in South Iran by National Iranian Oil Company. Higher qualifications essential. Salary not less than £3000 a year. Experienced practitioner required aged between 30–40 preferably. 2-year tours of duty followed by home leave on full pay. Married accommodation and family passages available.—Write: Box L.452, c/o 191, Gresham House, E.C.2.

Young Diagnostic Radiologist, interested in general medicine, required for private practice, Wimpole-street.—Address, No. 233, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Bedroom-Study adjoining in professionals charming home, St. John's Wood, as sole guest. H.W. in bedroom—breakfast—service—heat, &c., 8½ guineas per week. Meals by arrangement. Resident housekeeper.—Address, No. 235, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1*s.* fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Live Leeches always in stock.—Apply : R. Brooks & Co., Lucullus House, 4, Barbican, London, E.C.1.

Hypnotism. Will all Doctors interested in this subject for Medical purposes please write to the Secretary, British Society of Medical Hypnotists, 126, Harley-street, W.1.

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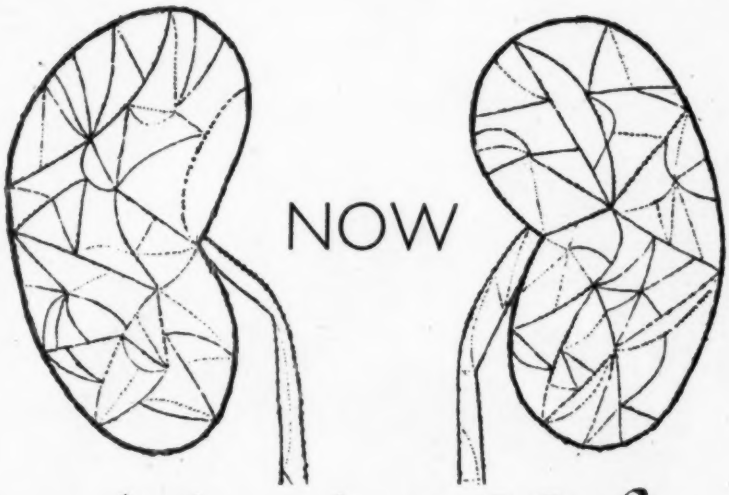

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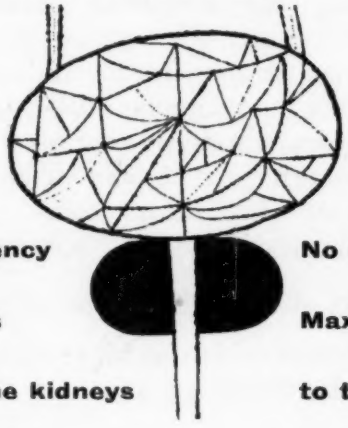

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